UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DIALECT, LLC, *Plaintiff*, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., *Defendants*.	Civil Action No. 2:23-cv-61 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT AND DAMAGES
AND DEMAND FOR JURY TRIAL

Plaintiff Dialect, LLC ("Dialect" or "Plaintiff") files this Complaint for Patent Infringement and Damages against Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively, "Samsung" or "Defendants") and alleges as follows:

INTRODUCTION

1. The novel inventions disclosed in U.S. Patent Nos. 7,398,209 (the "'209 Patent"); 7,502,738 (the "'738 Patent"); 7,917,367 (the "'367 Patent"); 8,140,327 (the "'327 Patent"); 8,195,468 (the "'468 Patent"); 8,447,607 (the "'607 Patent"); 8,849,652 (the "'652 Patent"); 9,495,957 (the "'957 Patent"); and 9,734,825 (the "'825 Patent") (collectively, the "Asserted Patents") in this matter were invented by VoiceBox Technologies ("VoiceBox"). VoiceBox was a key pioneer in the fields of voice recognition technology and natural language understanding ("NLU"). These technologies power a wide variety of consumer electronics and provide key functionality for smart phones, tablets, TVs, and Internet of Things ("IoT") devices. VoiceBox spent more than a decade developing and building key early NLU inventions producing one of the most valuable portfolios of technology according to the Institute of Electrical and Electronics

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Engineers ("IEEE"), including the Asserted Patents. The Asserted Patents in this case are the result of this substantial investment and research.

2. Over the years, the inventions claimed in the Asserted Patents have been licensed to key companies in the industry.

THE PARTIES

3. Plaintiff is the current owner and assignee of the Asserted Patents.

4. Plaintiff is a Texas limited liability company with its principal place of business located at 133 E. Tyler St., Longview, TX 75601-7216.

5. On information and belief, Defendant Samsung Electronics Co., Ltd. ("SEC") is a company organized and existing under the laws of the Republic of Korea. SEC has a principal place of business located at 129 Samsung-Ro, Yeongtong-Gu, Suwon-Shi, Gyeonggi-Do, 16677, Republic of Korea. SEC's Information Technology & Mobile Communications division is responsible for the design, manufacture, and sale of mobile devices, such as smartphones, and related software, applications, and payment services that operate on cellular networks around the world and in the United States.

6. On information and belief, Defendant Samsung Electronics America, Inc. ("SEA") is a corporation organized and existing under the laws of the State of New York with its principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. On information and belief, SEA is a wholly owned subsidiary of SEC. SEA has a business location in this District at 6625 Excellence Way, Plano, Texas 75023. Defendant SEA may be served at least via its registered agent for service of process in Texas, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

7. On information and belief, Defendants directly and/or indirectly develop, design, manufacture, distribute, market, offer to sell and/or sell infringing products and services in the United States, including in the Eastern District of Texas, and otherwise direct infringing activities to this District in connection with their products and services as set forth in this Complaint.

JURISDICTION

8. This civil action arises under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq.*, including without limitation 35 U.S.C. §§ 271, 281, 283, 284, and 285. Accordingly, this Court has subject matter jurisdiction under, *inter alia*, 28 U.S.C. §§ 1331 and 1338(a).

9. This District has general and specific personal jurisdiction over Defendants because Defendants have committed acts, directly or through intermediaries, in this District, giving rise to this action; are present in and transact and conduct business in this District and the State of Texas; and transact and conduct business with residents of this District and the State of Texas.

10. Plaintiff's causes of action arise, at least in part, from Defendants' contacts with and activities in this District and the State of Texas.

11. Defendants have infringed the Asserted Patents within this District and the State of Texas by making, using, selling, offering for sale, and/or importing in or into this District and elsewhere in the State of Texas, products that infringe the Asserted Patents, including, without limitation, products that practice the claimed methods of the Asserted Patents. Defendants, directly and through intermediaries, make, use, sell, offer for sale, import, ship, distribute, advertise, promote, and/or otherwise commercialize such infringing products in or into this District and the State of Texas. Defendants regularly conduct and solicit business in, engage in other persistent courses of conduct in, and/or derive substantial revenue from goods and services provided to residents of this District and the State of Texas.

12. This Court has personal jurisdiction over Defendants pursuant to TEX. CIV. PRAC. & REM. CODE § 17.041 *et seq*.

13. Personal jurisdiction exists over Defendants because Defendants have minimum contacts with this forum as a result of business regularly conducted within this District and the State of Texas, and, on information and belief, specifically as a result of, at least, committing the tort of patent infringement within this District and the State of Texas.

14. This Court also has personal jurisdiction over Defendants, in part, because Defendants each do continuous and systematic business in this District, including by providing infringing products and services to the residents of this District that Defendants knew would be used within this District, and by soliciting business from the residents of this District.

15. For example, Defendants are subject to personal jurisdiction in this Court because, *inter alia*, Defendants through agents regularly solicit and transact business in this District and have an established place of business in this District. Accordingly, this Court's jurisdiction over the Defendants comports with the constitutional standards of fair play and substantial justice and arises directly from Defendants' purposeful minimum contacts with the State of Texas.

16. This Court also has personal jurisdiction over Defendants because Defendants have made their products available for, at least, purchase and use within this District.

17. Venue is proper in this Court under 28 U.S.C. §§ 1391 and 1400(b).

18. For example, on information and belief, SEA maintains a regular and established place of business in this judicial district a 6625 Excellence Way, Plano, Texas 75023 and has committed acts of infringement in this District.

19. Additionally, venue is proper as to SEC, a foreign corporation, because suits against foreign entities are proper in any judicial district under 28 U.S.C. § 1391(c)(3).

20. Defendants have not contested proper venue and exercise of personal jurisdiction in this District for patent infringement in actions in the past. *See, e.g.*, Answer, ¶¶ 13, 18, *Cal. Inst. Tech v. Samsung Elecs. Co., Ltd. et al.*, No. 2:21-cv-00446, Dkt. 19 (E.D. Tex. Apr. 5, 2022); Answer to Amended Complaint, ¶¶ 6, 7, *Jawbone Innovations, LLC v. Samsung Elecs. Co., Ltd. et al.*, No. 2:21-cv-00186, Dkt. 27 (E.D. Tex. Dec. 9, 2021).

SAMSUNG'S ATTEMPT TO ACQUIRE VOICEBOX'S PATENTED INNOVATIONS

21. On or about 2013, VoiceBox was approached by a third-party patent dealer, Red Chalk, about the purchase of the VoiceBox patent portfolio, including the Asserted Patents. Red Chalk initially would not identify its client who was interested in acquiring the patent portfolio. After making multiple increasing offers for the portfolio, Red Chalk's representative flew from Chicago to the Seattle headquarters of VoiceBox to discuss an acquisition. As a prerequisite to meeting, VoiceBox required the disclosure of the interested client. Red Chalk stated that it had permission to reveal the client's identity and disclosed that its client was Samsung. VoiceBox ultimately declined Samsung's offer to purchase the VoiceBox patent portfolio.

THE ASSERTED PATENTS

22. The VoiceBox inventions contained in the Asserted Patents in this case relate to groundbreaking improvements to voice recognition and NLU and have particular application in consumer electronics such as smart phones, tablets, and IoT devices.

U.S. PATENT NO. 7,398,209

23. On July 8, 2008, the U.S. Patent Office duly and legally issued the '209 Patent, entitled "Systems And Methods For Responding To Natural Language Speech Utterance." A true and correct copy of the '209 Patent is attached hereto as **Exhibit 1**.

24. Dialect is the owner and assignee of all right, title, and interest in and to the ’209 Patent, including the right to assert all causes of action arising under the ’209 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

25. The ’209 Patent describes, among other things, novel systems and methods for receiving natural language queries and/or commands. ’209 Patent, Abstract. The claimed invention makes significant use of context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for one or more users. *Id*. As the ’209 Patent explains, prior to its inventions, a machine’s ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, in the prior art “human questions and machine processing of queries may be fundamentally incompatible,” because “a person asking a question or giving a command typically relies heavily on context and the domain knowledge of the person answering,” whereas “machine-based queries” are “highly structured and are not inherently natural to the human user.” *Id.* at 1:27-35. The inventions described and claimed in the ’209 Patent overcome these challenges in various embodiments, for example by providing a system that uses domain agents, which are executables that receive process and respond to user questions, to organize domain specific behavior and information. *Id.* at 2:48-59. The inventions in various embodiments further include a system capable of parsing and interpreting the natural language query to “determine the domain of expertise required and context, invoking the proper resources, including agents.” *Id.* at 4:46-54.

26. The novel features of the invention are recited in the claims. For example, claim 1 of the ’209 Patent recites:

> A method responsive to a user generated natural language speech utterance, comprising:
>
> receiving the user generated natural language speech utterance, the received user utterance containing at least one request;

> maintaining a dynamic set of prior probabilities or fuzzy possibilities usable at each stage of processing the received user utterance;
>
> recognizing words and phrases contained in the received utterance using information in one or more dictionary and phrase tables;
>
> parsing the recognized words and phrases to determine a meaning of the utterance, wherein determining the meaning includes determining a context for the at least one request contained in the utterance based on one or more keywords contained in the recognized words and phrases;
>
> 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;
>
> formulating the at least one request contained in the utterance in accordance with a grammar used by the selected domain agent to process requests associated with the determined context;
>
> invoking the selected domain agent to process the formulated request; and
>
> presenting results of the processed request to the user, the presented results generated as a result of the invoked domain agent processing the formulated request.

'209 Patent at claim 1.

27. Figure 6 of the '209 Patent, reproduced below, shows a block diagram of a process for determining the proper domain agents to invoke and properly formatting queries for the agents according to one embodiment of the invention.

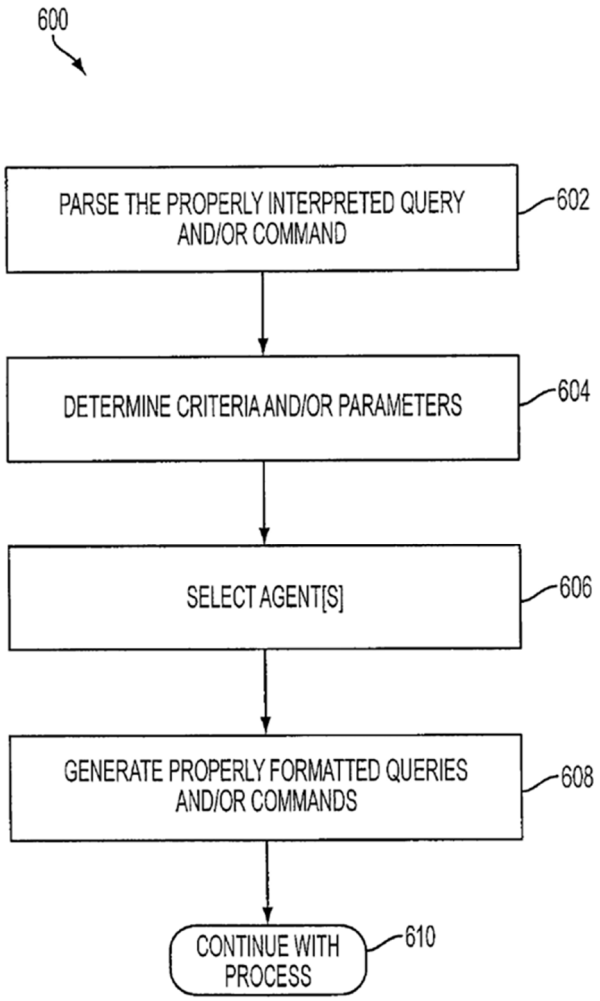


FIG. 6

'209 Patent, Fig. 2.

U.S. PATENT NO. 7,502,738

28. On March 10, 2009, the U.S. Patent Office duly and legally issued the '738 Patent, entitled "Systems And Methods For Responding To Natural Language Speech Utterance." A true and correct copy of the '738 Patent is attached hereto as **Exhibit 2**.

29. Dialect is the owner and assignee of all right, title, and interest in and to the '738 Patent, including the right to assert all causes of action arising under the '738 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

30. The ’738 Patent describes, among other things, novel systems and methods for receiving natural language queries and/or commands. ’738 Patent, Abstract. The claimed invention makes significant use of context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for one or more users. *Id*. As the ’738 Patent explains, prior to its inventions, a machine’s ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, in the prior art “human questions and machine processing of queries may be fundamentally incompatible,” because “a person asking a question or giving a command typically relies heavily on context and the domain knowledge of the person answering,” whereas “machine-based queries” are “highly structured and are not inherently natural to the human user.” *Id.* at 1:26-37. The inventions described and claimed in the ’738 Patent overcome these challenges in various embodiments, for example by providing a system that uses agents, which are executables that receive process and respond to user questions, to organize domain specific behavior and information. *Id.* at 2:47-56. The inventions in various embodiments, include an “update manager” that “is used to add new agents to the system.” *Id.* at 2:63-67.

31. The novel features of the invention are recited in the claims. For example, claim 1 of the ’738 Patent recites:

> A system responsive to a user generated natural language speech utterance, comprising:
>
> an agent architecture that includes a plurality of domain agents, each of the plurality of domain agents being an autonomous executable configured to receive, process, and respond to requests associated with a respective context;
>
> a parser configured to determine a context for one or more keywords contained in the utterance and to determine a meaning of the utterance based on the determined context, wherein the parser selects at least one of the plurality of domain agents based on the determined meaning, wherein the selected domain agent is configured to receive, process, and respond to requests associated with the determined context;

an event manager configured to coordinate interaction between the parser and the agent architecture; and

an update manager that enables the user to purchase one or more domain agents from a third party on a one-time or subscription basis.

’738 Patent at claim 1.

32. Figure 2 of the ’738 Patent, reproduced below, shows a schematic block diagram of an embodiment showing the agent architecture.

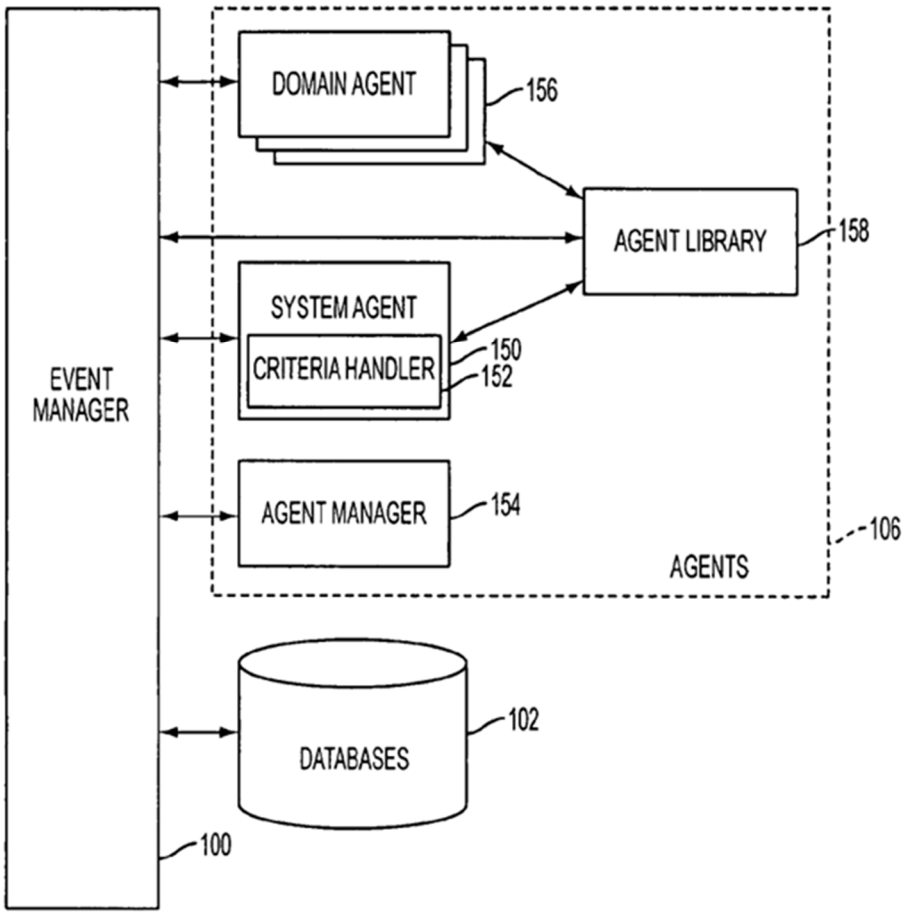


FIG. 2

’738 Patent, Fig. 2.

U.S. PATENT NO. 7,917,367

33. On March 29, 2011, the U.S. Patent Office duly and legally issued the '367 Patent, entitled "Systems And Methods For Responding To Natural Language Speech Utterance." A true and correct copy of the '367 Patent is attached hereto as **Exhibit 3**.

34. Dialect is the owner and assignee of all right, title, and interest in and to the '367 Patent, including the right to assert all causes of action arising under the '367 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

35. The '367 Patent describes, among other things, systems and methods for receiving speech and non-speech communications in natural language to execute the questions and/or commands therein. '367 Patent, Abstract. Embodiments of the claimed invention can use context, prior information, domain knowledge, and user specific profile data in processing the question or command. *Id*. As the '367 Patent explains, prior to its inventions, a machine's ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, under the existing systems and devices "verbal communications and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible," because the existing systems and devices use requests that are "highly structured and may not be inherently natural to the human user." *Id*. at 1:37-43. "Cognitive research on human interaction," however, "shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person." *Id*. at 1:33-37. The inventions described and claimed in the '367 Patent overcome these challenges in various embodiments, for example by providing a system that uses a context manager that registers multiple devices and subscribes

those devices to manage and synchronize context events associated with NLU across those devices. *Id.* 2:61-3:9.

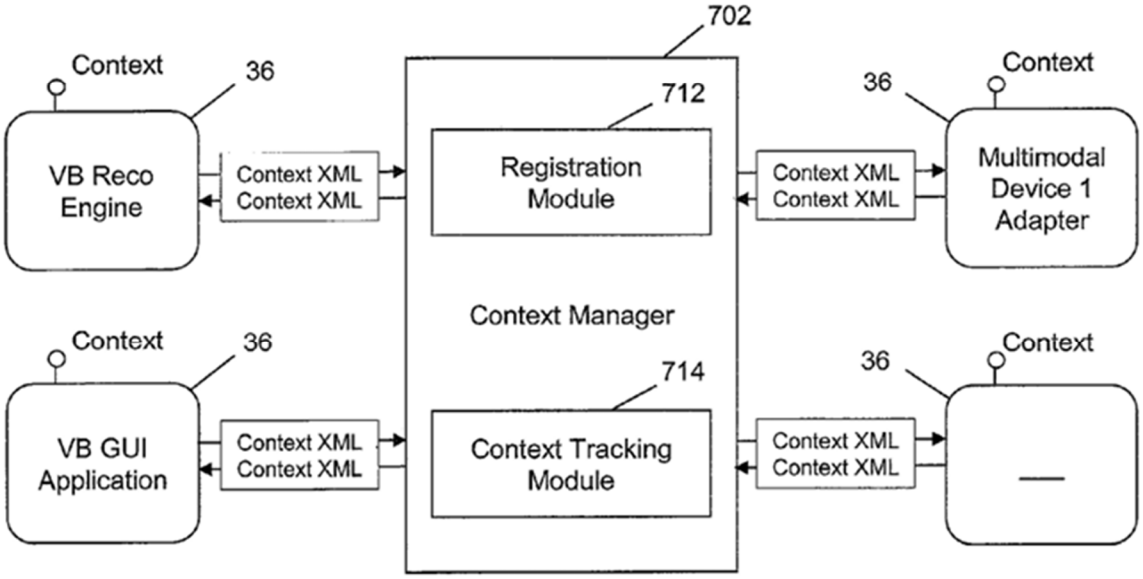
36. The novel features of the invention are recited in the claims. For example, claim 1 of the ’367 Patent recites:

> A system for processing multi-modal natural language inputs, comprising:
>
> a context manager communicatively coupled to a plurality of mobile devices, wherein the context manager includes one or more processors configured to:
>
> register the plurality of mobile devices with the context manager in response to a registration module associated with the context manager receiving a communication from the plurality of mobile devices;
>
> subscribe the plurality of mobile devices registered with the context manager to one or more context events;
>
> receive a context input from one or more of the plurality of mobile devices registered with the context manager, wherein the context input includes a context change event; and
>
> inform the plurality of mobile devices registered with the context manager of the context change event, thereby synchronizing a context across the plurality of mobile devices.

’367 Patent at claim 1.

37. Figure 7 of the ’367 Patent, reproduced below, shows a diagram of an embodiment of the interactive natural language processing system.

FIG. 7



'367 Patent, Fig. 7.

U.S. PATENT NO. 8,140,327

38. On March 20, 2012, the U.S. Patent Office duly and legally issued the '327 Patent, entitled "System And Method For Filtering And Eliminating Noise From Natural Language Utterances To Improve Speech Recognition And Parsing." A true and correct copy of the '327 Patent is attached hereto as **Exhibit 4**.

39. Dialect is the owner and assignee of all right, title, and interest in and to the '327 Patent, including the right to assert all causes of action arising under the '327 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

40. The '327 Patent describes, among other things, a novel mobile system and method that filters and eliminates noise from natural language utterances to improve accuracy associated with speech recognition and parsing. '327 Patent, Abstract. The claimed invention uses a

microphone array and a filter to process a speech signal before it is sent to an encoder. *Id*. As the ’327 Patent explains, existing systems “are generally unable to provide a complete environment for users to make natural language speech queries and receive natural sounding responses.” *Id*. at 1:56-59. According to the ’327 Patent, prior to its inventions, a machine’s ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, there “remains a number of significant barriers to creation of a complete natural language speech-based query and response environment.” *Id*. at 1:59-61. The inventions described and claimed in the ’327 Patent overcome some of these challenges in various embodiments, “including environments with background noise, point noise sources and people holding conversations, for example by providing a method that uses “one-dimensional or two-dimensional array microphones to receive human speech” and “filtering of speech input.” *Id.* 7:35-51.

41. The novel features of the invention are recited in the claims. For example, claim 14 of the ’327 Patent recites:

> A system for filtering and eliminating noise from natural language speech utterances, comprising:
>
> a microphone array configured to add one or more nulls to a beam pattern steered to point in a direction associated with a user speaking a natural language utterance to capture an input speech signal corresponding to the natural language utterance, wherein the one or more nulls notch out point or limited area noise sources from the input speech signal;
>
> an adaptive filter coupled to the microphone array, wherein the adaptive filter is configured to:
>
> receive the input speech signal corresponding to the natural language utterance from the microphone array and compare environmental, noise to the input speech signal to set one or more parameters associated with the adaptive filter;
>
> use band shaping and notch filtering to remove narrow-band noise from the input speech signal received from the microphone array according to the one or more parameters; and

> suppress cross-talk and environmentally caused echoes in the input speech signal received from the microphone array using adaptive echo cancellation;
>
> a speech coder arranged between the adaptive filter and a speech recognition engine, wherein the speech coder is configured to receive the input speech signal passed through the adaptive filter and use adaptive lossy audio compression to remove momentary gaps from the input speech signal and variable rate sampling to compress and digitize the input speech signal, wherein the speech coder optimizes the adaptive lossy audio compression and the variable rate sampling to only preserve components in the input speech signal that will be input to the speech recognition engine; and
>
> a transceiver configured to communicate the digitized input speech signal from a buffer in the speech coder to the speech recognition engine at a rate that depends on available bandwidth associated with a communication link that connects the transceiver and the speech recognition engine.

’327 Patent at claim 14.

42. Figure 1 of the ’327 Patent, reproduced below, shows an overall diagrammatic view, including an array microphone, according to one embodiment of the invention.

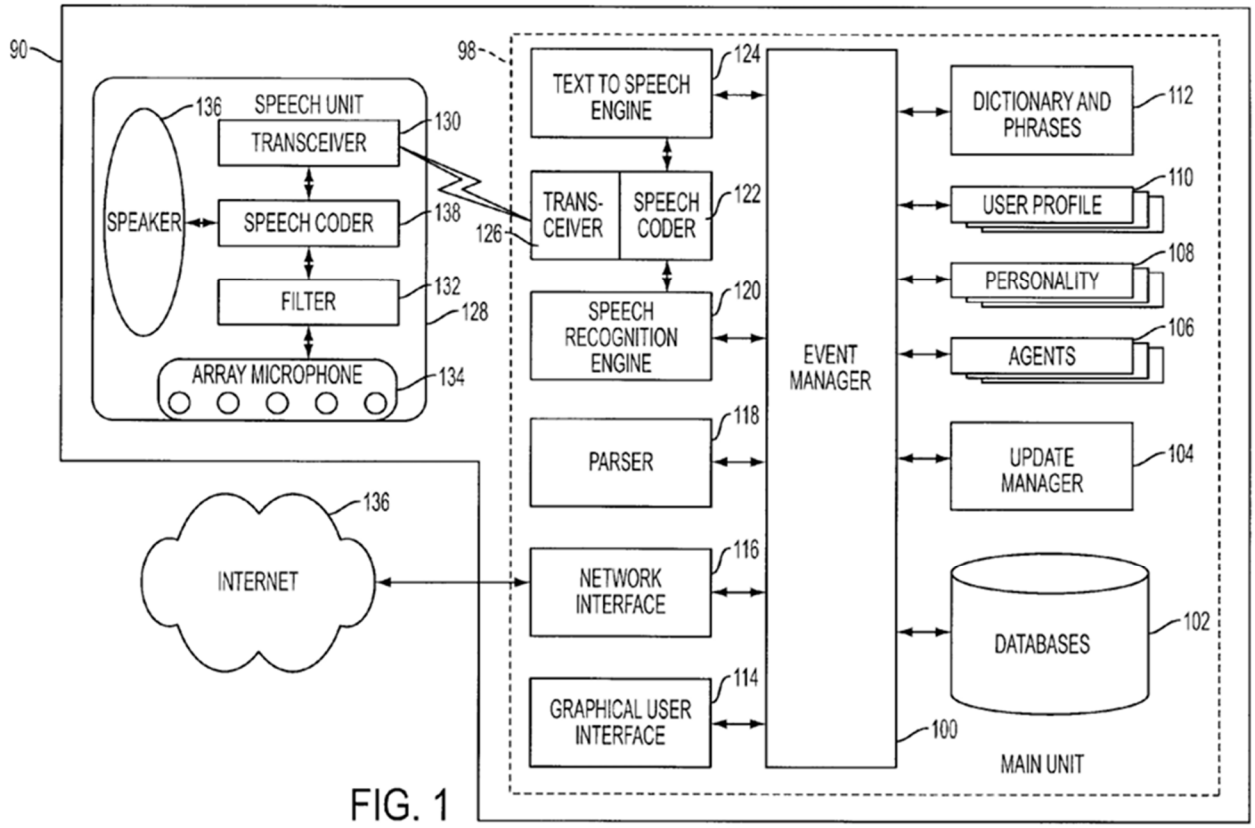


FIG. 1

'327 Patent, Fig. 1.

U.S. PATENT NO. 8,195,468

43. On June 5, 2012, the U.S. Patent Office duly and legally issued the '468 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions." A true and correct copy of the '468 Patent is attached hereto as **Exhibit 5**.

44. Dialect is the owner and assignee of all right, title, and interest in and to the '468 Patent, including the right to assert all causes of action arising under the '468 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

45. The '468 Patent describes, among other things, a novel mobile system that identifies and uses context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for users to submit natural language requests. '468 Patent, Abstract.

The claimed invention creates, stores and uses extensive personal profile information for each user to improve the reliability of determining the context of a request and presenting the expected results. *Id*. As the '468 Patent explains, prior to its inventions, a machine's ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, under the existing systems and devices "verbal communications and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible," because the existing systems and devices use requests that are "highly structured and may not be inherently natural to the human user." *Id*. at 1:53-58. "Cognitive research on human interaction," however, "shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person." *Id*. at 1:49-52. The inventions described and claimed in the '468 Patent overcome these challenges in various embodiments, for example by providing a system that uses "multi-modal communications that enable displaying of non-speech search results on a graphical interface" in conjunction with "speech commands" to execute requests. *Id.* at 21:49-60.

46. The novel features of the invention are recited in the claims. For example, claim 1 of the '468 Patent recites:

> A mobile device for processing multi-modal natural language inputs, comprising:
>
> a conversational voice user interface that receives a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input, the conversational voice user interface coupled to a transcription module that transcribes the non-speech input to create a non-speech-based transcription;
>
> a conversational speech analysis engine that identifies the user that provided the multi-modal natural language input, the conversational speech analysis engine using a speech recognition engine and a semantic knowledge-based model to create a speech-based transcription of the natural language utterance, wherein the semantic knowledge-based model includes a personalized cognitive model derived from one or more prior interactions between the identified user and the mobile device, a general cognitive

> model derived from one or more prior interactions between a plurality of users and the mobile device, and an environmental model derived from an environment of the identified user and the mobile device;
>
> a merging module that merges the speech-based transcription and the non-speech-based transcription to create a merged transcription;
>
> a knowledge-enhanced speech recognition engine that identifies one or more entries in a context stack matching information contained in the merged transcription and determines a most likely context for the multi-modal natural language input based on the identified entries; and
>
> a response generating module that identifies a domain agent associated with the most likely context for the multi-modal input, communicates a request to the identified domain agent, and generates a response to the user from content provided by the identified domain agent as a result of processing the request.

'468 Patent at claim 1.

U.S. PATENT NO. 8,447,607

47. On May 21, 2013, the U.S. Patent Office duly and legally issued the '607 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions." A true and correct copy of the '607 Patent is attached hereto as **Exhibit 6**.

48. Dialect is the owner and assignee of all right, title, and interest in and to the '607 Patent, including the right to assert all causes of action arising under the '607 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

49. The '607 Patent describes, among other things, a novel mobile system that identifies and uses context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for users to submit natural language requests. '607 Patent, Abstract. The claimed invention creates, stores and uses extensive personal profile information for each user to improve the reliability of determining the context of a request and presenting the expected results. *Id*. As the '607 Patent explains, prior to its inventions, a machine's ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, under the existing systems and devices "verbal communications

and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible," because the existing systems and devices use requests that are "highly structured and may not be inherently natural to the human user." *Id*. at 1:56-61. "Cognitive research on human interaction," however, "shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person." *Id*. at 1:52-55. The inventions described and claimed in the '607 Patent overcome these challenges in various embodiments, for example by providing a system that uses "multi-modal communications that enable displaying of non-speech search results on a graphical interface" in conjunction with "speech commands" to execute requests. *Id.* at 21:49-60.

50. The novel features of the invention are recited in the claims. For example, claim 1 of the '607 Patent recites:

> A device for processing natural language inputs, comprising one or more processors configured to:
>
> receive a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input;
>
> generate a non-speech transcription from the non-speech input;
>
> identify the user who provided the multi-modal natural language input;
>
> generate a speech-based transcription based on a cognitive model associated with the user, wherein the cognitive model includes information on one or more prior interactions between the user and the device;
>
> generate a merged transcription from the speech-based transcription and the non-speech transcription;
>
> identify, from among a plurality of entries that are in a context stack and that are each indicative of context, an entry in the context stack that matches information in the merged transcription;
>
> identify a domain agent associated with the entry in the context stack;
>
> determine a request based on the merged transcription; and
>
> communicate the request to the domain agent, wherein the domain agent is configured to generate a response to the user.

'607 Patent at claim 1.

U.S. PATENT NO. 8,849,652

51. On September 30, 2014, the U.S. Patent Office duly and legally issued the '652 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions." A true and correct copy of the '652 Patent is attached hereto as **Exhibit 7**.

52. Dialect is the owner and assignee of all right, title, and interest in and to the '652 Patent, including the right to assert all causes of action arising under the '652 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

53. The '652 Patent describes, among other things, a novel mobile system that identifies and uses context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for users to submit natural language requests. '652 Patent, Abstract. The claimed invention creates, stores and uses extensive personal profile information for each user to improve the reliability of determining the context of a request and presenting the expected results. *Id*. As the '652 Patent explains, prior to its inventions, a machine's ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, under the existing systems and devices "verbal communications and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible," because the existing systems and devices use requests that are "highly structured and may not be inherently natural to the human user." *Id*. at 1:58-63. "Cognitive research on human interaction," however, "shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person." *Id*. at 1:54-57. The inventions described and claimed in the '652 Patent overcome these challenges in various embodiments, for example by providing a system that uses context information determined from a command or request, comparing it against one or more

words to create a score for context entries and generating a context stack to enable future requests. *Id. at* 4:5-55. The context stacks can be synchronized across multiple devices. *Id.* at 4:20-36.

54. The novel features of the invention are recited in the claims. For example, claim 1 of the ’652 Patent recites:

> 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 Patent at claim 1.

U.S. PATENT NO. 9,495,957

55. On November 15, 2016, the U.S. Patent Office duly and legally issued the ’957 Patent, entitled “Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions.” A true and correct copy of the ’957 Patent is attached hereto as **Exhibit 8**.

56. Dialect is the owner and assignee of all right, title, and interest in and to the ’957 Patent, including the right to assert all causes of action arising under the ’957 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

57. The ’957 Patent describes, among other things, a novel mobile system that identifies and uses context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for users to submit natural language requests. ’957 Patent, Abstract. The claimed invention creates, stores and uses extensive personal profile information for each user to improve the reliability of determining the context of a request and presenting the expected results. *Id*. As the ’957 Patent explains, prior to its inventions, a machine’s ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. As described in the specification, under the existing systems and devices “verbal communications and machine processing of requests that are extracted from the verbal communications may be fundamentally incompatible,” because the existing systems and devices use requests that are “highly structured and may not be inherently natural to the human user.” *Id*. at 1:60-66. “Cognitive research on human interaction,” however, “shows that verbal communication, such as a person asking a question or giving a command, typically relies heavily on context and domain knowledge of the target person.” *Id*. at 1:57-60. The inventions described and claimed in the ’957 Patent overcome these challenges in various embodiments, for example by providing a system that uses context information determined from a command or request, comparing it against one or more words to create a score for context entries and generating a context stack to enable future requests. *Id.* 4:5-55.

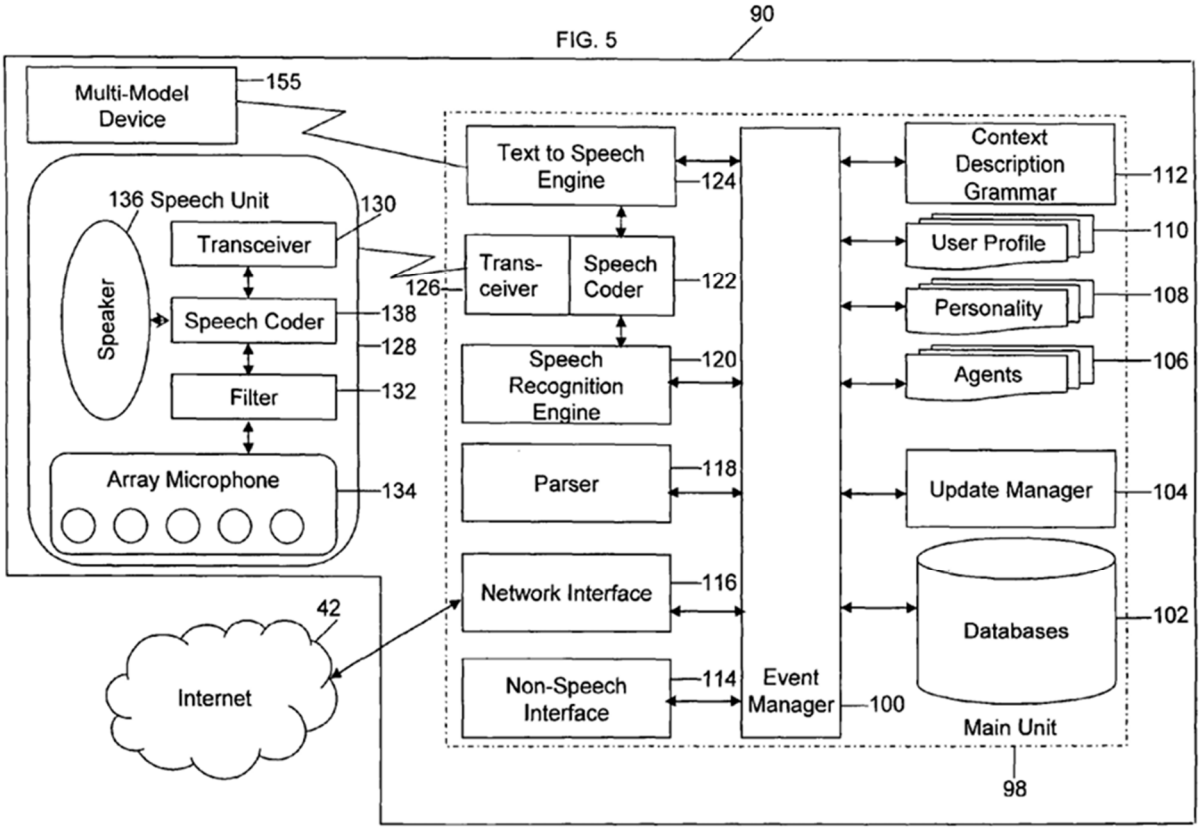
58. The novel features of the invention are recited in the claims. For example, claim 1 of the ’957 Patent recites:

> A system for processing a natural language utterance, the system including one or more processors executing one or more computer program modules which, when executed, cause the one or more processors to:
>
> generate a context stack comprising context information that corresponds to a plurality of prior utterances, wherein the context stack includes a plurality of context entries;

> receive the natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request;
>
> determine one or more words of the natural language utterance by performing speech recognition on the natural language utterance;
>
> identify, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries, wherein identifying the one or more context entries comprises:
>
> > comparing the plurality of context entries to the one or more words;
> >
> > generating, based on the comparison, one or more rank scores for individual context entries of the plurality of context entries; and
> >
> > identifying, based on the one or more rank scores, the one or more context entries from among the plurality of context entries; and
>
> determine, based on the determined one or more words and the context information, the command or the request associated with the natural language utterance.

’957 Patent at claim 1.

59. Figure 5 of the ’957 Patent, reproduced below, shows a block diagram of an embodiment of the interactive natural language processing system.



'957 Patent, Fig. 5.

U.S. PATENT NO. 9,734,825

60. On August 15, 2017, the U.S. Patent Office duly and lawfully issued the '825 Patent, entitled "Methods And Apparatus For Determining A Domain Based On The Content And Context Of A Natural Language Utterance." A true and correct copy of the '825 Patent is attached hereto as **Exhibit 9**.

61. Dialect is the owner and assignee of all right, title, and interest in and to the '825 Patent, including the right to assert all causes of action arising under the '825 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

62. The '825 Patent describes, among other things, novel systems and methods that provide a fully integrated environment in which a user can submit natural language speech

questions and commands and the information that is sought, or the action requested, can be obtained from local and/or network queries. ’825 Patent, 1:28-34. The inventions described in the ’825 Patent allow for the presentation of results of a natural language speech question in a natural manner even where the question asked, or the responses received, are incomplete, ambiguous or subjective. *Id*. at 1:35–40.

63. As the ’825 Patent explains, prior to the inventions, a machine’s ability to communicate with humans in a natural manner was a difficult technical problem in need of a technical solution. ’825 Patent at 1:44-46. The substantial challenge overcome in the ’825 Patent was that machine-based queries were highly structured and not inherently natural to the human user, whereas human users typically rely heavily on context and the domain knowledge of the person answering the question. *Id.* at 1:47-52. Thus, existing systems were unable to provide a complete environment for users to make natural language speech queries and receive natural sounding responses. *Id.* at 1:61-64.

64. The ’825 Patent overcomes these issues in various embodiments, for example by providing agents organized to address domain specific behavior that receive, process and respond to user questions and commands through a natural language parser that uses prior probabilities and uses context scoring to select one or more domain agents associated with a context.

65. The novel features of the invention are recited in the claims. For example, claim 1 of the ’825 Patent recites:

> A system responsive to a user generated natural language speech utterance, comprising:
>
> a plurality of autonomous executable domain agents, each of which is configured to respond to queries and/or commands within a particular domain, wherein the particular domain indicates an area of expertise within which the domain agent is configured to respond to the queries and/or commands;

a speech recognition engine configured to recognize one or more words in the user generated natural language speech utterance;

a parser configured to:

receive from a system agent or an active domain agent of the plurality of autonomous executable domain agents, keyword and associated prior probabilities or fuzzy possibilities;

determine, for the natural language speech utterance, a score for each of at least two possible contexts, wherein the scores are determined based on the received keyword and associated prior probabilities or fuzzy possibilities;

determine a domain for the user generated natural language utterance based on the recognized one or more words of the natural language utterance and the determined scores for each of the at least two possible contexts;

select at least one of the plurality of domain agents based, at least in part, on the determined domain; and

provide at least one query and/or command based on the natural language utterance to the selected at least one of the plurality of domain agents,

wherein each of the selected at least one of the plurality of domain agents is configured to create one or more queries based on the at least one query and/or command and send the one or more queries in an asynchronous manner to one or more local or external information sources.

’825 Patent, Claim 1.

66. Figure 4A in the ’825 Patent, reproduced below, shows a flow chart illustrating a process for receiving natural language speech-based queries and generating a response according to an embodiment of the invention.

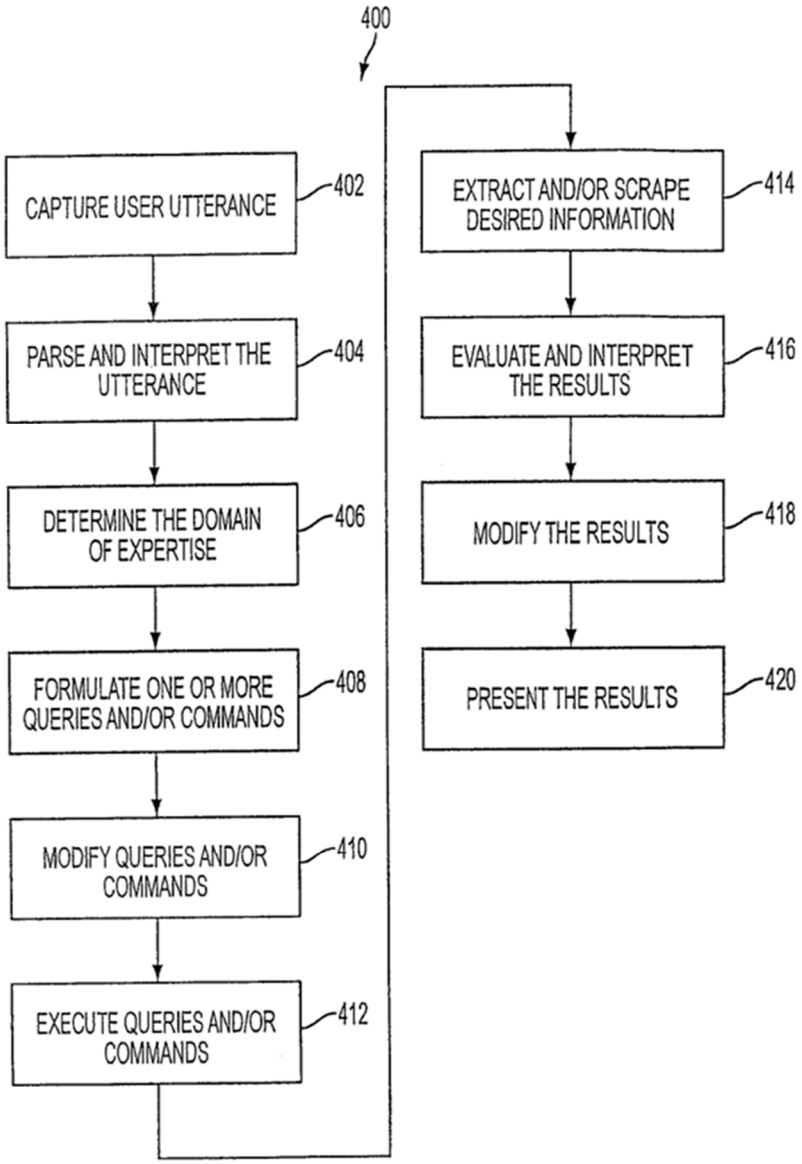


FIG. 4A

'825 Patent, Fig. 4A.

<u>SAMSUNG'S USE OF THE PATENTED TECHNOLOGY</u>

67. Samsung is a South Korean multinational manufacturing conglomerate founded in 1938. Samsung is a major manufacturer of electronic components. Samsung is one of the global

leaders in mobile device, tablet, and IoT device manufacturing, and in the third quarter of 2022 Samsung reported a revenue of $54 billion.

68. Samsung also makes, uses, sells, and/or offers to sell in the United States, and/or imports into the United States smartphones, tablets, wearables and IoT devices, such as the Samsung Galaxy smartphones and Samsung Galaxy tablets, which incorporate voice-recognition software agents, including the Samsung Bixby Platform, that infringe the Asserted Patents as described in the counts below.

FIRST COUNT
(Infringement of U.S Patent No. 7,398,209)

69. Dialect incorporates by reference the allegations set forth in Paragraphs 1–68 of the Complaint as though fully set forth herein.

70. The claims of the ’209 Patent are valid and enforceable.

71. The claims of the ’209 Patent are directed to patentable subject matter. Particularly, the ’209 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’209 Patent improve on the natural language processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

72. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’209 Patent, including at least Claim 1 of the ’209 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’209 Patent, including but not limited to Samsung products including a voice-recognition software

platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the "'209 Patent Accused Products").

73. Each of the '209 Patent Accused Products comprises a method responsive to a user generated natural language speech utterance, comprising: receiving the user generated natural language speech utterance, the received user utterance containing at least one request; maintaining a dynamic set of prior probabilities or fuzzy possibilities usable at each stage of processing the received user utterance; recognizing words and phrases contained in the received utterance using information in one or more dictionary and phrase tables; parsing the recognized words and phrases to determine a meaning of the utterance, wherein determining the meaning includes determining a context for the at least one request contained in the utterance based on one or more keywords contained in the recognized words and phrases; 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; formulating the at least one request contained in the utterance in accordance with a grammar used by the selected domain agent to process requests associated with the determined context; invoking the selected domain agent to process the formulated request; and presenting results of the processed request to the user, the presented results generated as a result of the invoked domain agent processing the formulated request, as specified and claimed by Claim 1 of the '209 Patent.

74. Each of the '209 Patent Accused Products comprises a method responsive to a user generated natural language speech utterance.

75. For example, the Samsung Bixby platform is programmed to execute one or more methods for responding to a user generated natural language request.

76. Each of the ’209 Patent Accused Products comprises receiving the user generated natural language speech utterance, the received user utterance containing at least one request.

77. For example, the Samsung Bixby platform uses the natural language from the user as the input and associates the utterance with a command or request.[1]

> Bixby uses natural language (NL) from the user as input. You can improve Bixby's ability to understand NL input by training Bixby to understand real-world examples of natural language in Bixby Developer Studio (Bixby Studio). For example, in the Quick Start Guide, you train the dice game to recognize "roll 2 6-sided dice". This phrase is an **utterance**. NL training is based on utterances that humans might type or say when interacting within Bixby. Utterances don't have to be grammatical and can include slang or colloquial language.

An utterance, as that term is used in the Samsung Bixby platform documentation, is a natural language request.[2]

> **Utterance**
>
> A *natural language* request made actually or potentially made by *user*.

78. Each of the ’209 Patent Accused Products comprises maintaining a dynamic set of prior probabilities or fuzzy possibilities usable at each stage of processing the received user utterance.

79. For example, the Samsung Bixby platform is described as using training to help the natural language processor consistently apply knowledge from prior interactions to consistently apply the correct meaning.[3]

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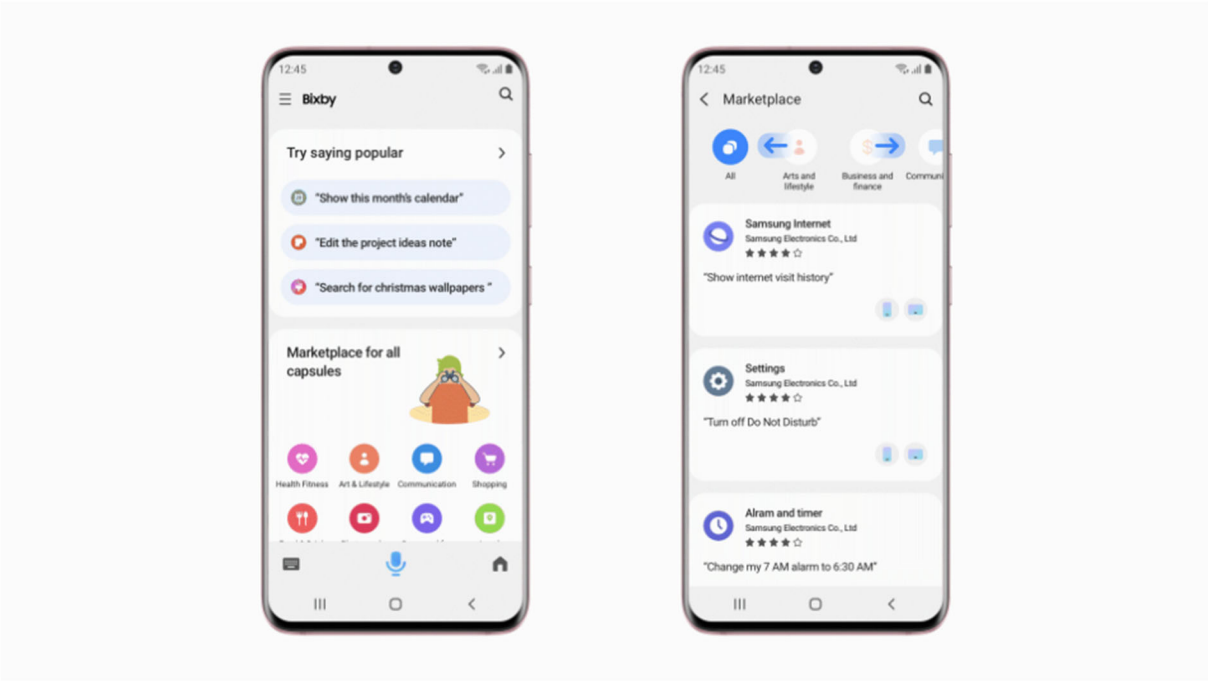
[1] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.training-for-nl
[2] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary
[3] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.training-for-nl

Bixby learns how to handle NL utterances by example. You provide training examples that consist of sample utterances annotated to connect words and phrases to your capsule's concepts and actions, aligning them to an intent. With good training examples, Bixby will do more than simply memorize the words and their meaning. It will automatically learn the most important aspects of those examples and apply that knowledge to new, unseen words and sentences to consistently apply the correct meaning to user requests. In short, natural language training teaches the platform about sentence meaning.

The Samsung Bixby platform is further described as using these prior usage patterns across devices registered with the Samsung Bixby platform in natural language processing.[4]

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.

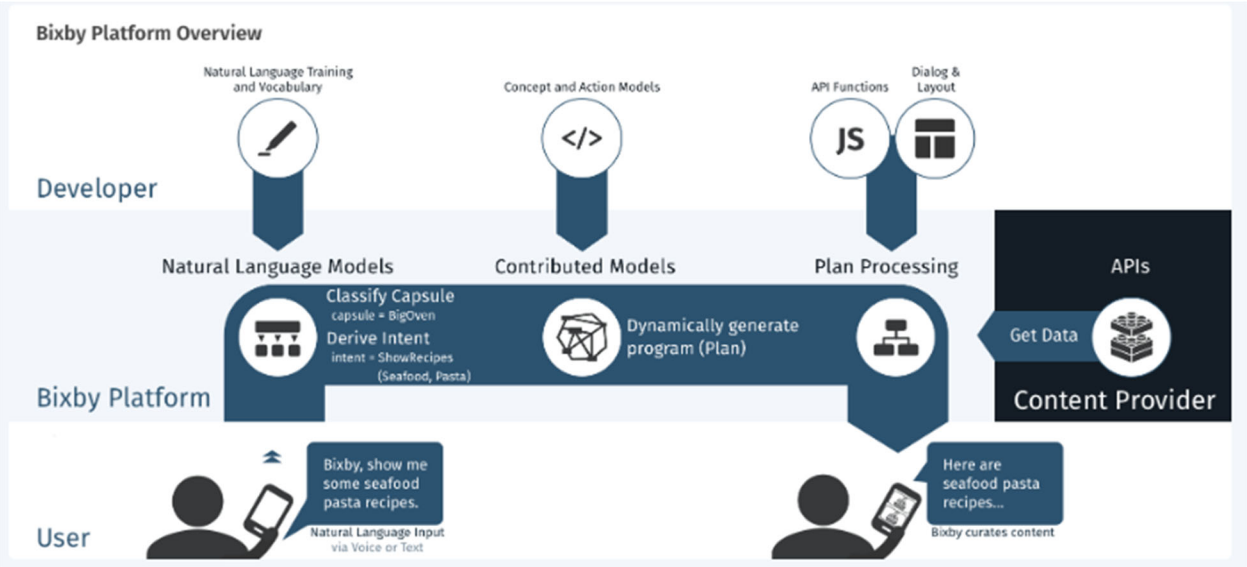


Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

[4] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

80. Each of the ’209 Patent Accused Products comprises recognizing words and phrases contained in the received utterance using information in one or more dictionary and phrase tables.

81. For example, the Samsung Bixby platform is described as recognizing words in the process of deriving intent from the received utterance.[5]



Vocabulary in the Samsung Bixby platform documentation expressly refers to words or phrases that the natural language models recognize.[6]

Vocabulary

Words or phrases contributed to a particular node, to allow NL intent interpretation to recognize when that node is referred to. For more information, see Extending Training with Vocabulary.

The Samsung Bixby platform documentation further describes using vocabulary to build a dictionary or phrase table.[7]

[5] https://bixbydevelopers.com/dev/docs/get-started/overview
[6] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary
[7] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.vocabulary

Vocabulary for Primitives

Imagine a user who is looking to watch a movie tonight. Instead of simply saying, "What movies are playing tonight?", the user might ask, "What comedies are playing tonight?" Your capsule can handle this case by supplying vocabulary.

To do this, create a new file of type **Vocabulary** within your capsule (**File > New File**) in the language-specific resource folder the vocabulary belongs to (in this case, `en`). This will create a new `*.vocab.bxb` file under that folder.

Note
If you are planning to localize your capsule, you must create a separate `vocab` file for that concept within each language-specific resource folder your capsule supports.

You can then add a word/phrase list for the corresponding concept:

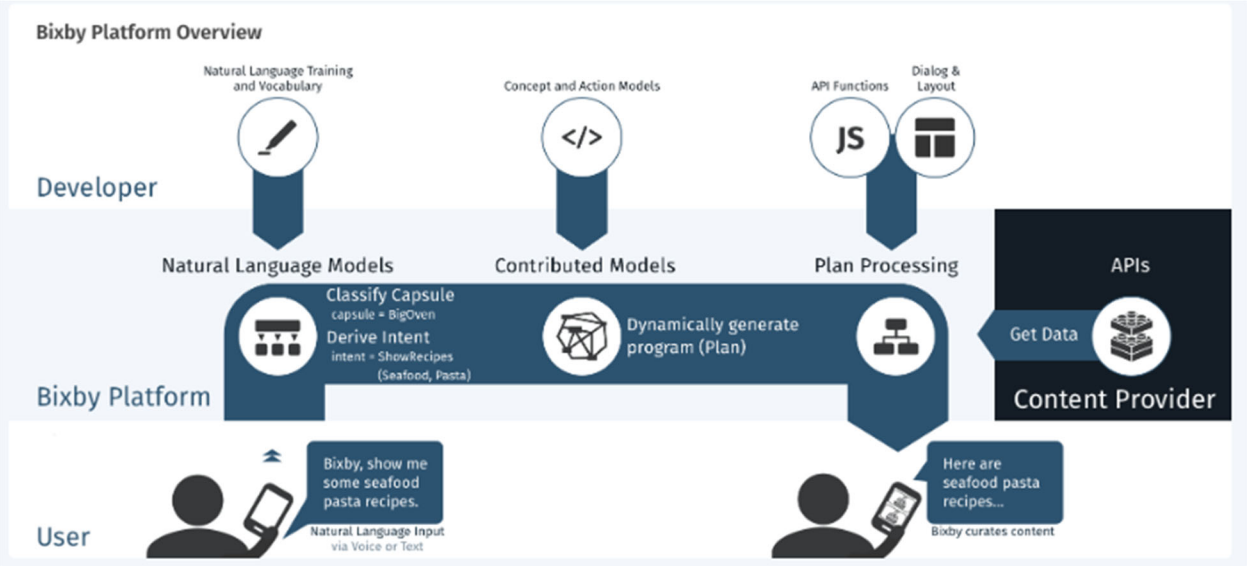
```
vocab (MovieGenre) {
  "comedies"
  "cartoons"
  "animation"
  "mysteries"
  "romances"
  "documentaries"
}
```

This list doesn't specify the only possible values for the `MovieGenre` concept. It provides hints that help Bixby's natural language understanding when the user's utterance lacks clear context.

82. Each of the ’209 Patent Accused Products comprises parsing the recognized words and phrases to determine a meaning of the utterance, wherein determining the meaning includes determining a context for the at least one request contained in the utterance based on one or more keywords contained in the recognized words and phrases.

83. For example, the Samsung Bixby platform is described as parsing recognized words in the process of deriving intent from the received utterance.[8]

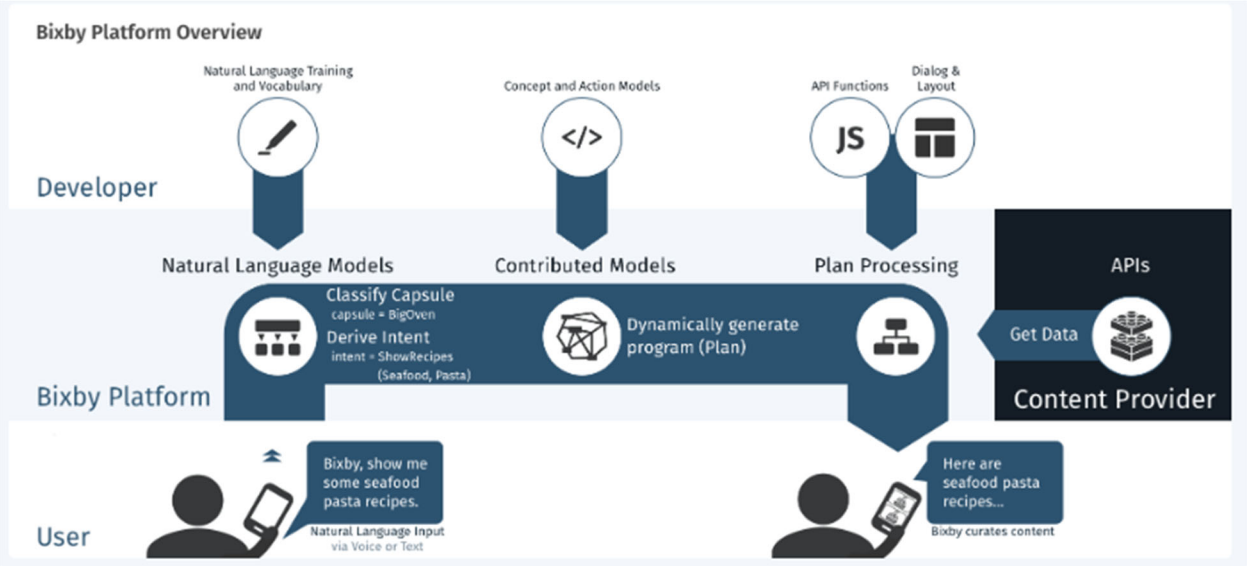
[8] https://bixbydevelopers.com/dev/docs/get-started/overview



84. Each of '209 Patent Accused Products comprises 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.

85. For example, the Samsung Bixby platform is described as selecting a capsule, that receives, processes, and responds to requests associated with the derived intent.[9]

[9] https://bixbydevelopers.com/dev/docs/get-started/overview



The Samsung Bixby platform describes capsules as modules configured to receive process and respond to requests associated with a specific context.[10]

Developing for Bixby is different than traditional software development because you're not writing the program; the Artificial Intelligence (AI) is. You perform modeling, which is how you teach Bixby about the feature or domain you're implementing. Using your models and others we provide, Bixby constructs a program that satisfies the user's specific request in milliseconds the moment the request is made. This is known as **Dynamic Program Generation**, and it's one major feature that separates Bixby from other personal assistants. With other approaches, you have to hard-code logic that handles every use case and interaction. You must decide what services get called, when to ask the user something, and how to apply machine learning, so that the assistant doesn't ask the same questions every time you run into that use case.

On the other hand, with Bixby, you simply teach Bixby how to write these programs. With the right modeling and training, you can create a capsule that allows users to say something like this:

"Get me a window seat on a non-stop one-way flight from JFK to San Francisco three days after next Friday"

In just a few milliseconds, Bixby can generate a 40-plus step program to:

- do the math and figure out the date for "three days after next Friday"
- look up candidate airports for San Francisco
- convert between various data types
- and more!

The capsules of the Samsung Bixby platform are described units of related functionality.[11]

[10] https://bixbydevelopers.com/dev/docs/get-started/overview
[11] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary

Capsule

A unit of contribution in the Marketplace, consisting of a group of related functionality. It also delineates permissions among developers. For more information, see the Overview.

86. Each of the '209 Patent Accused Products comprises formulating the at least one request contained in the utterance in accordance with a grammar used by the selected domain agent to process requests associated with the determined context.

87. For example, the Samsung Bixby platform is described as identifying the best goals, or requests, in a capsule based on the parsed natural language utterance.[12]

Keep in mind that, when Bixby receives a user request, it attempts to identify a relevant capsule or gives low confidence if no capsules are relevant (such as if the user gives a random or garbage request). Once a capsule is chosen, Bixby then tries to identify the most relevant goal for the utterance. If there is only one goal in your capsule, then that is considered the *best* goal. You are restricted to testing only your capsule, so strive to ensure your capsule addresses all of the utterances for your use cases. While testing, you should not have to worry about extraneous utterances matching your capsule as those will not be the case with your users.

The Samsung Bixby platform is described as using concepts to format the grammar of a capsule.[13]

[12] https://bixbydevelopers.com/dev/docs/dev-guide/developers/customizing-plan.planner-overview

[13] https://bixbydevelopers.com/dev/docs/dev-guide/developers/modeling.modeling-concepts

A **concept** describes any "thing." It could represent a concrete object, such as coffee, flowers, or an airport. A concept can also be abstract, such as a day, flight, or order. Well-modeled concepts are essential to Bixby because the planner uses concept models as inputs and goals when executing plans. Concepts are comparable to data types and data structures in a programming language.

Primitive concepts represent simple types, like text or numbers. **Structure concepts** are more complex, representing records with named properties. Each property is itself a concept. A property is usually a primitive concept, but could be a structure concept itself.

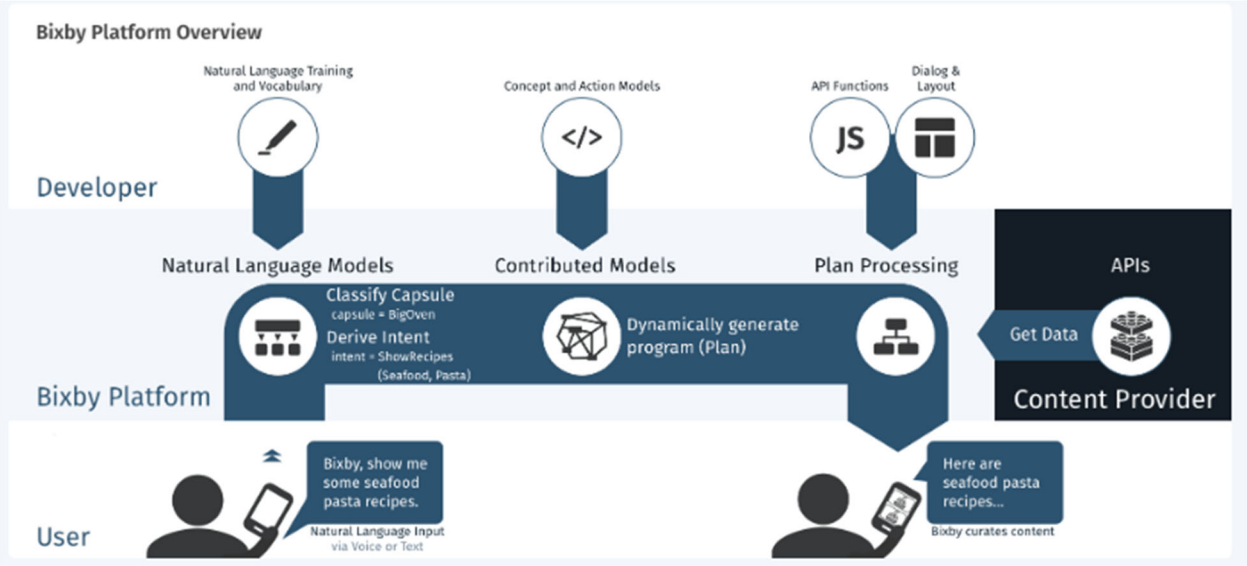
Concepts can also model inheritance relationships. For example, a restaurant inherits the properties of a business, as shown in the following snippet from a structure:

```
structure (restaurant.Restaurant) {
  description (A business who prepares and serves food to customers)
  extends (business.Business)
...
```

As you start to build out your concepts, make sure that you have read Bixby's Design Guidelines so that your models follow a consistent user experience.

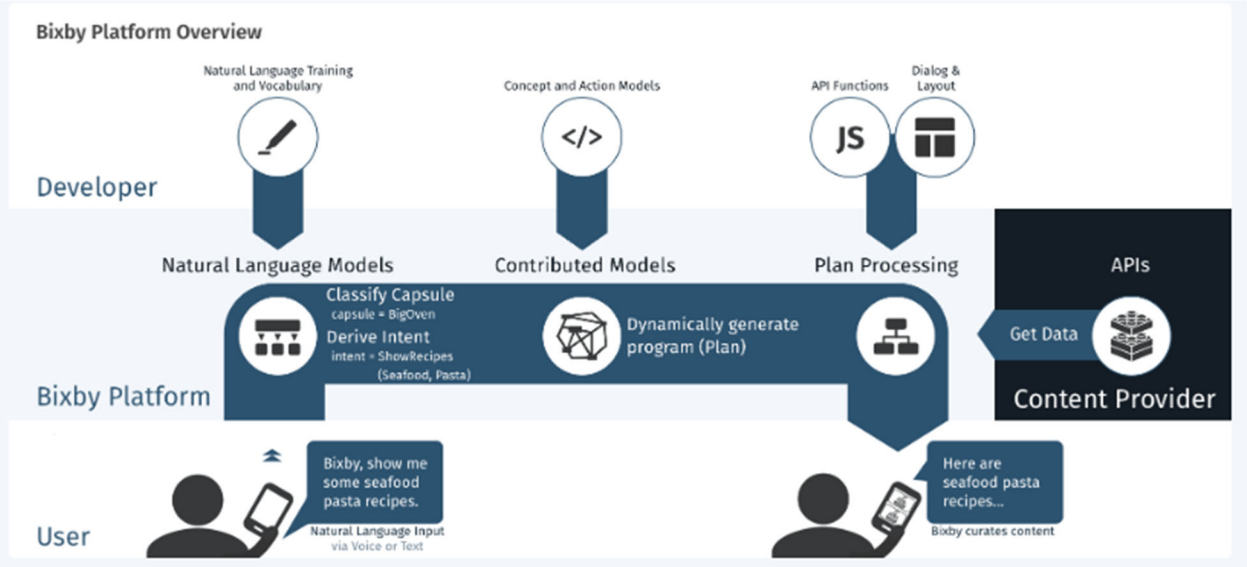
The Samsung Bixby platform is further described as using the derived intent to formulate the complete request as a plan. .[14]

[14] https://bixbydevelopers.com/dev/docs/get-started/overview



88. Each of the ’209 Patent Accused Products comprises invoking the selected domain agent to process the formulated request.

89. For example, the Samsung Bixby platform is described as processing the generated plan.[15]

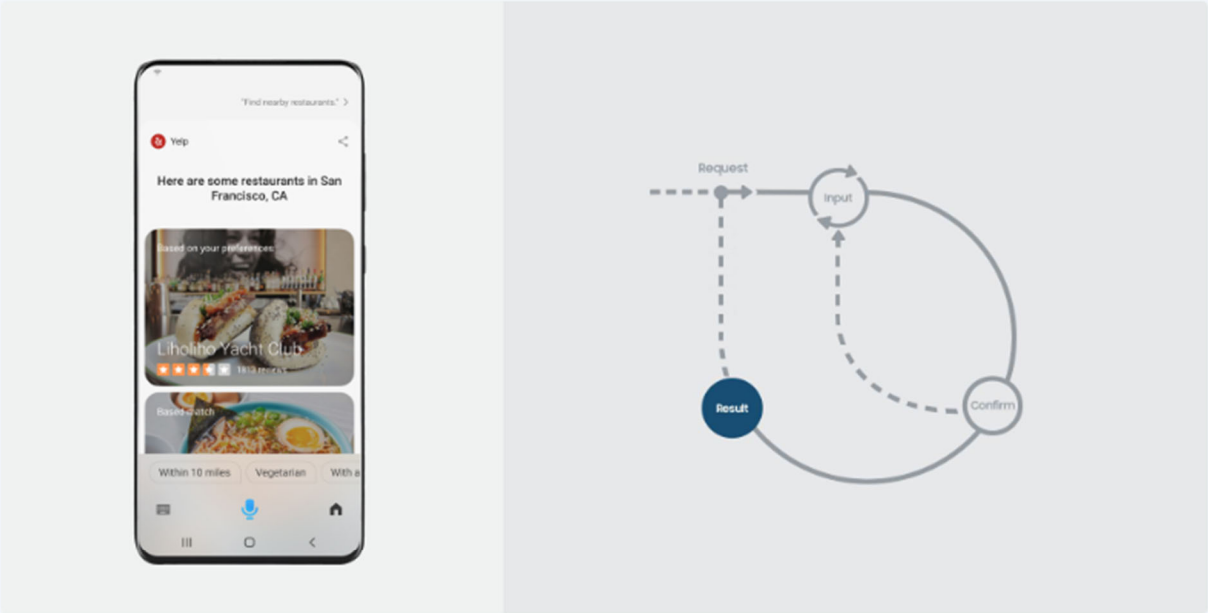


[15] https://bixbydevelopers.com/dev/docs/get-started/overview

90. Each of the ’209 Patent Accused Products comprises presenting results of the processed request to the user, the presented results generated as a result of the invoked domain agent processing the formulated request.

91. For example, the Samsung Bixby platform is described as generating a Result Moment as a result of Bixby gathering all of the information required and invoking the capsule.[16]

Result Moment



Bixby completes an action or presents information that delivers on the user’s goal in a Result Moment. It can be in the form of a list of results, a single result, or the receipt of a transaction.

Prior to a Result Moment, Bixby gathers all the information your service needs to fulfill on a user’s intention (See Input Moment), and it has confirmed with the user if necessary (See Confirmation Moment). As an assistant, Bixby’s goal is always to accelerate the conversation leading up to results.

92. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’209 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

[16] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/service.Result

93. Users of the ’209 Patent Accused Products directly infringe at least Claim 1 of the ’209 Patent when they use the ’209 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’209 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’209 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’209 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’209 Patent, or, alternatively, was willfully blind to the infringement.

94. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the ’209 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’209 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’209 Patent, or, alternatively, was willfully blind to the infringement.

95. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’209 Patent, constituting a material part of the invention. Such components may include but are not limited to one or more processors

configured to present results of the processed natural language request to the user, the presented results generated as a result of the invoked domain agent processing the formulated request. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’209 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

96. Samsung is not licensed or otherwise authorized to practice the claims of the ’209 Patent.

97. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the ’209 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

98. On information and belief, Samsung has known about the ’209 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the ’209 Patent at least as of the filing of this Complaint. Accordingly, Samsung’s infringement of the ’209 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys’ fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

99. As a result of Samsung’s infringement of the ’209 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung’s infringement, but in no event less than a reasonable royalty with interest and costs.

100. On information and belief, Samsung will continue to infringe the ’209 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’209 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

SECOND COUNT
(Infringement of U.S Patent No. 7,502,738)

101. Dialect incorporates by reference the allegations set forth in Paragraphs 1–100 of the Complaint as though fully set forth herein.

102. The claims of the ’738 Patent are valid and enforceable.

103. The claims of the ’738 Patent are directed to patentable subject matter. Particularly, the ’738 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’738 Patent improve on the natural language processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

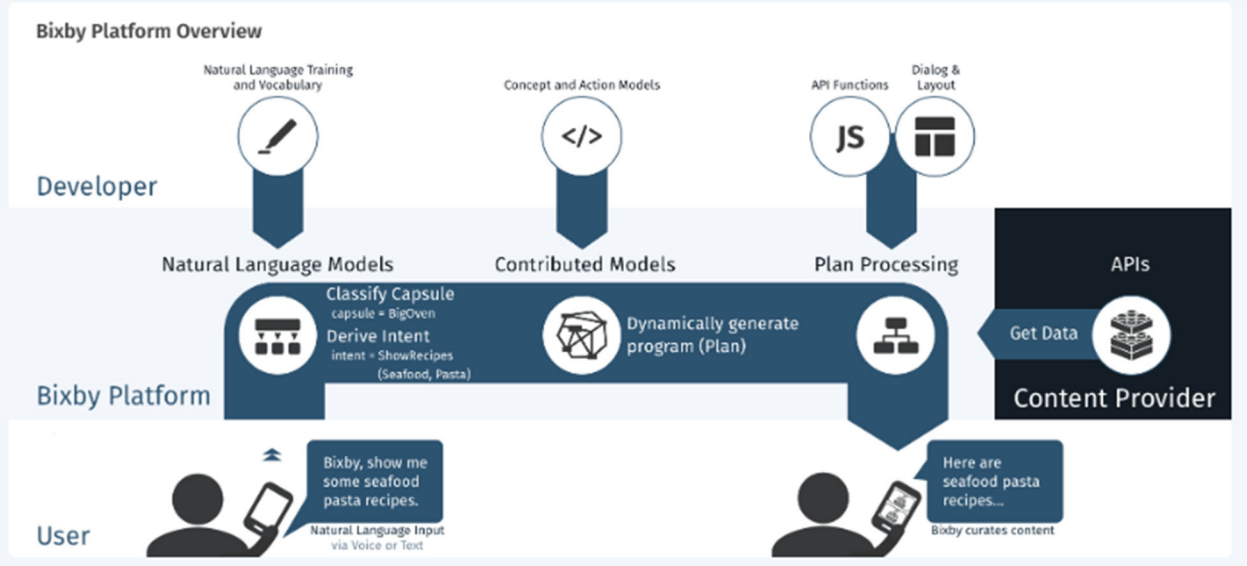
104. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’738 Patent, including at least Claim 1 of the ’738 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’738 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’ ’738 Patent Accused Products”).

105. Each of the ’738 Patent Accused Products comprises a system responsive to a user generated natural language speech utterance, comprising: an agent architecture that includes a plurality of domain agents, each of the plurality of domain agents being an autonomous executable configured to receive, process, and respond to requests associated with a respective context; a parser configured to determine a context for one or more keywords contained in the utterance and to determine a meaning of the utterance based on the determined context, wherein the parser selects

at least one of the plurality of domain agents based on the determined meaning, wherein the selected domain agent is configured to receive, process, and respond to requests associated with the determined context; an event manager configured to coordinate interaction between the parser and the agent architecture; and an update manager that enables the user to purchase one or more domain agents from a third party on a one-time or subscription basis, as specified and claimed by Claim 1 of the ’738 Patent.

106. Each of the ’738 Patent Accused Products comprises a system responsive to a user generated natural language speech utterance.

107. For example, the Samsung Bixby platform uses natural language processing to process natural language requests and determine one or more commands or requests.[17]



[17] https://bixbydevelopers.com/dev/docs/get-started/overview

On the other hand, with Bixby, you simply teach Bixby how to write these programs. With the right modeling and training, you can create a capsule that allows users to say something like this:

"Get me a window seat on a non-stop one-way flight from JFK to San Francisco three days after next Friday"

In just a few milliseconds, Bixby can generate a 40-plus step program to:

- do the math and figure out the date for "three days after next Friday"
- look up candidate airports for San Francisco
- convert between various data types
- and more!

108. Each of the '738 Patent Accused Products comprises an agent architecture that includes a plurality of domain agents, each of the plurality of domain agents being an autonomous executable configured to receive, process, and respond to requests associated with a respective context.

109. For example, the Samsung Bixby platform includes a number of capsules configured to receive, process, and respond to requests associated with a specific domain.[18]

[18] https://bixbydevelopers.com/dev/docs/get-started/overview

Developing for Bixby is different than traditional software development because you're not writing the program; the Artificial Intelligence (AI) is. You perform modeling, which is how you teach Bixby about the feature or domain you're implementing. Using your models and others we provide, Bixby constructs a program that satisfies the user's specific request in milliseconds the moment the request is made. This is known as **Dynamic Program Generation**, and it's one major feature that separates Bixby from other personal assistants. With other approaches, you have to hard-code logic that handles every use case and interaction. You must decide what services get called, when to ask the user something, and how to apply machine learning, so that the assistant doesn't ask the same questions every time you run into that use case.

On the other hand, with Bixby, you simply teach Bixby how to write these programs. With the right modeling and training, you can create a capsule that allows users to say something like this:

"Get me a window seat on a non-stop one-way flight from JFK to San Francisco three days after next Friday"

In just a few milliseconds, Bixby can generate a 40-plus step program to:

- do the math and figure out the date for "three days after next Friday"
- look up candidate airports for San Francisco
- convert between various data types
- and more!

The capsules of the Samsung Bixby platform are described as units of related functionality.[19]

Capsule

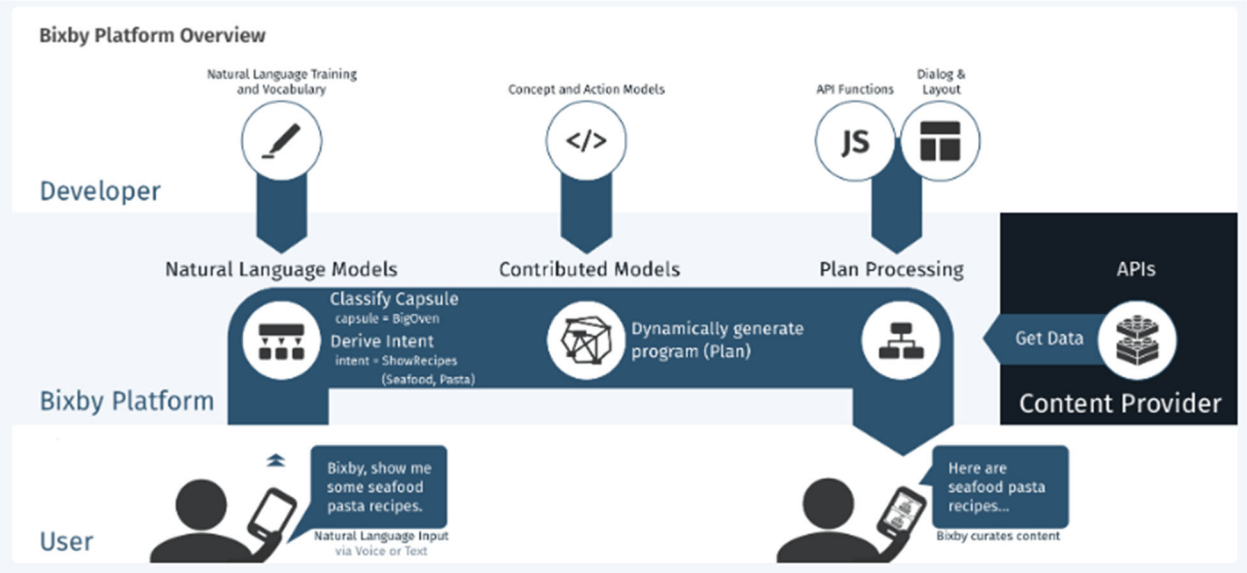
A unit of contribution in the Marketplace, consisting of a group of related functionality. It also delineates permissions among developers. For more information, see the Overview.

110. Each of the '738 Patent Accused Products comprises a parser configured to determine a context for one or more keywords contained in the utterance and to determine a meaning of the utterance based on the determined context, wherein the parser selects at least one of the plurality of domain agents based on the determined meaning, wherein the selected domain agent is configured to receive, process, and respond to requests associated with the determined context.

111. For example, the Samsung Bixby platform includes a parser that determines a derived intent for identified words from the user's natural language input to determine context and

[19] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary

select one of the plurality of capsules that is configured to receive, process and respond to the request.[20]



The Samsung Bixby platform is further described as identifying the relevant capsule based on the context determined by the natural language models.[21]

> Keep in mind that, when Bixby receives a user request, it attempts to identify a relevant capsule or gives low confidence if no capsules are relevant (such as if the user gives a random or garbage request). Once a capsule is chosen, Bixby then tries to identify the most relevant goal for the utterance. If there is only one goal in your capsule, then that is considered the *best* goal. You are restricted to testing only your capsule, so strive to ensure your capsule addresses all of the utterances for your use cases. While testing, you should not have to worry about extraneous utterances matching your capsule as those will not be the case with your users.

112. Each of the '738 Patent Accused Products comprises an event manager configured to coordinate interaction between the parser and the agent architecture.

113. For example, the Samsung Bixby platform is described as coordinating the interaction between the natural language parser and the capsules.[22]

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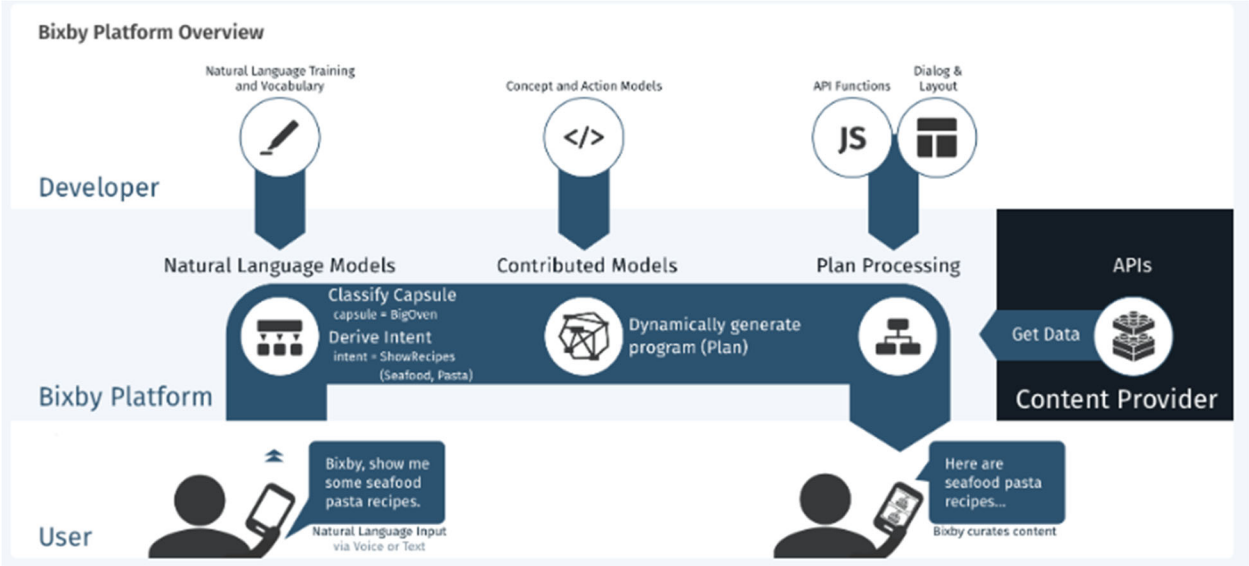
[20] https://bixbydevelopers.com/dev/docs/get-started/overview
[21] https://bixbydevelopers.com/dev/docs/dev-guide/developers/customizing-plan.planner-overview
[22] https://bixbydevelopers.com/dev/docs/get-started/overview



114. Each of the '738 Patent Accused Products comprises an update manager that enables the user to purchase one or more domain agents from a third party on a one-time or subscription basis.

115. For example, the Samsung Bixby platform includes a marketplace that is described as a "one-stop shop" for users to purchase "a wide range of services (known as capsules) to enhance their Bixby experience.[23, 24]

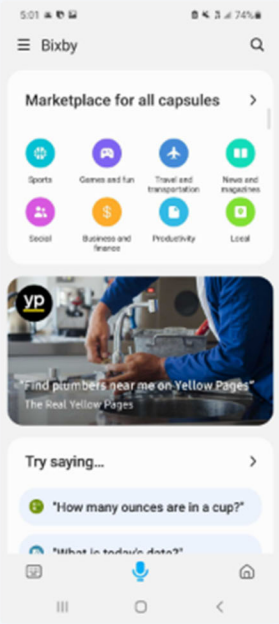
> The Bixby Marketplace is a one-stop shop for users to browse and add a wide range of services (known as capsules) to enhance their Bixby experience.
>
> This new platform is now open to users in U.S. and Korea. The Bixby Marketplace's official launch lays the foundation for an open ecosystem of useful services that developers will continuously enrich, and users will be able to make their mobile experience more personal and intuitive.

[23] https://news.samsung.com/global/the-bixby-marketplace-is-now-officially-open-in-the-us-and-korea

[24] https://bixbydevelopers.com/dev/docs/dev-guide/developers/deploying.can-submission

About the Marketplace

The Marketplace is a central repository for Bixby's capsules.



You submit your capsules to the Marketplace for review, and approved capsules can then be added by Bixby users. You can see the difference between the capsule's information page in the table below:

The marketplace includes capsules for apps that include subscription-based payments, such as Spotify.[25]

The Bixby Marketplace takes these customized experiences to the next level by offering easy access to a wide range of capsules that make Bixby more powerful, making it easier for users to tailor Bixby to suit their needs. The Marketplace includes a variety of convenience-enhancing capsules such as Google Maps, Spotify, iHeartRadio, NPR, Yelp and more.

116. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’738 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

117. Users of the ’738 Patent Accused Products directly infringe at least Claim 1 of the ’738 Patent when they use the ’738 Patent Accused Products in the ordinary, customary, and

[25] *Id.*

intended way. On information and belief, Samsung's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the '738 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the '738 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the '738 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the '738 Patent, or, alternatively, was willfully blind to the infringement.

118. On information and belief, Samsung's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the '738 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the '738 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the '738 Patent, or, alternatively, was willfully blind to the infringement.

119. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the '738 Patent, constituting a material part of the invention. Such components may include but are not limited to one or more processors configured to provide an update manager that enables the user to purchase one or more domain agents from a third party on a one-time or subscription basis. On information and belief, Samsung

knows and has known the same to be especially made or especially adapted for use in an infringement of the ’738 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

120. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’738 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to one or more processors configured to provide an update manager that enables the user to purchase one or more domain agents from a third party on a one-time or subscription basis.

121. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the ’738 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

122. Samsung is not licensed or otherwise authorized to practice the claims of the ’738 Patent.

123. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the ’738 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

124. On information and belief, Samsung has known about the ’738 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the ’738 Patent at least as of the filing of this Complaint. Accordingly, Samsung’s infringement of the ’738 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys’ fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

125. As a result of Samsung’s infringement of the ’738 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung’s infringement, but in no event less than a reasonable royalty with interest and costs.

126. On information and belief, Samsung will continue to infringe the ’738 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’738 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

THIRD COUNT
(Infringement of U.S Patent No. 7,917,367)

127. Dialect incorporates by reference the allegations set forth in Paragraphs 1–126 of the Complaint as though fully set forth herein.

128. The claims of the ’367 Patent are valid and enforceable.

129. The claims of the ’367 Patent are directed to patentable subject matter. Particularly, the ’367 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’367 Patent improve on the natural language processing of a natural

language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

130. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’367 Patent, including at least Claim 1 of the ’367 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’367 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’367 Patent Accused Products”).

131. Each of the ’367 Patent Accused Products comprises a system for processing multi-modal natural language inputs, comprising: a context manager communicatively coupled to a plurality of mobile devices, wherein the context manager includes one or more processors configured to: register the plurality of mobile devices with the context manager in response to a registration module associated with the context manager receiving a communication from the plurality of mobile devices; subscribe the plurality of mobile devices registered with the context manager to one or more context events; receive a context input from one or more of the plurality of mobile devices registered with the context manager, wherein the context input includes a context change event; and inform the plurality of mobile devices registered with the context manager of the context change event, thereby synchronizing a context across the plurality of mobile devices, as specified and claimed by Claim 1 of the ’367 Patent.

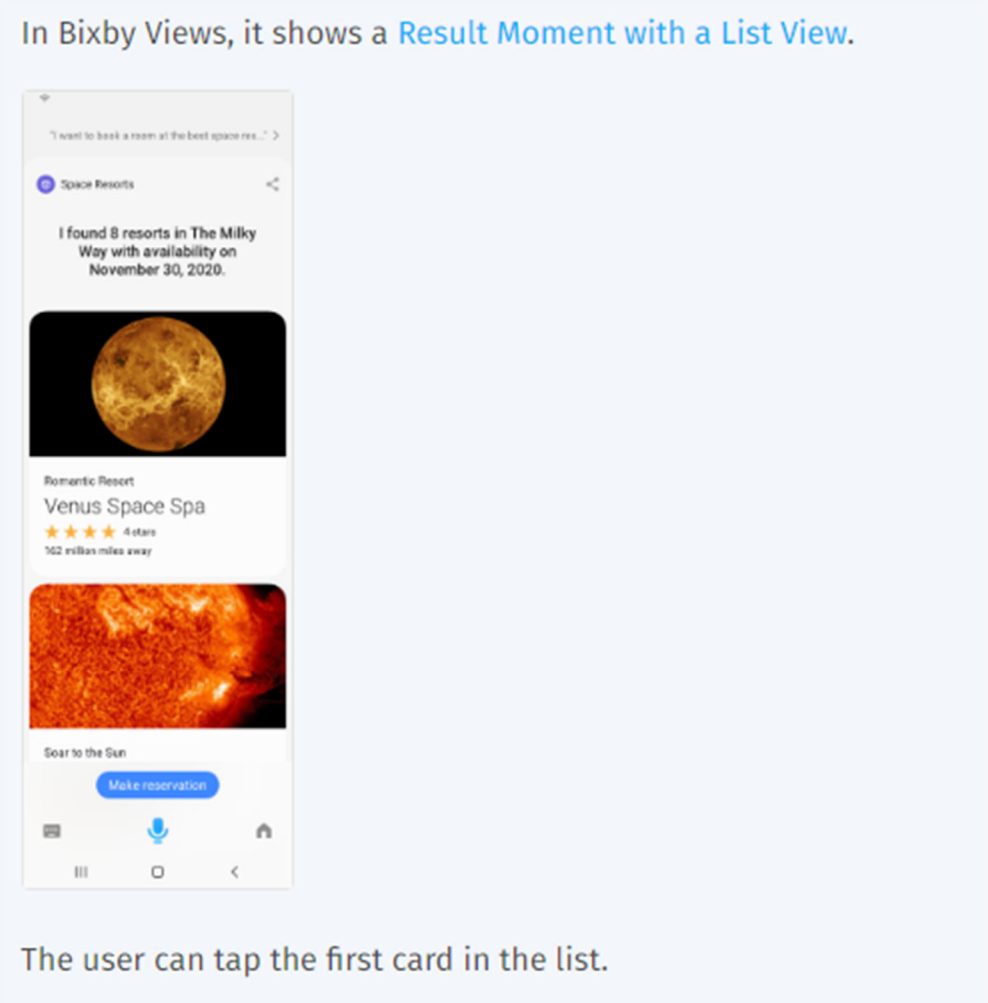
132. Each of the ’367 Patent Accused Products comprises a system for processing multi-modal natural language inputs.

133. For example, the Samsung Bixby platform is a system for processing multi-modal natural language inputs. The Samsung Bixby platform is a conversational voice user interface that can operate in "hand-on mode" in which the platform receives voice requests and receives non-speech inputs from users, including but not limited to touch navigation or buttons as necessary.[26]

- In **hands-on mode**, Bixby operates as if the user can see and interact with the screen. In this case, Bixby's spoken dialog should be minimal, while the screen (and Bixby Views) shows more robust information, with touch navigation or buttons if necessary.

Furthermore, in hands-on mode, the Samsung Bixby platform allows the user to tap cards in a list to create inputs for the platform.[27]

[26] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde
[27] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde



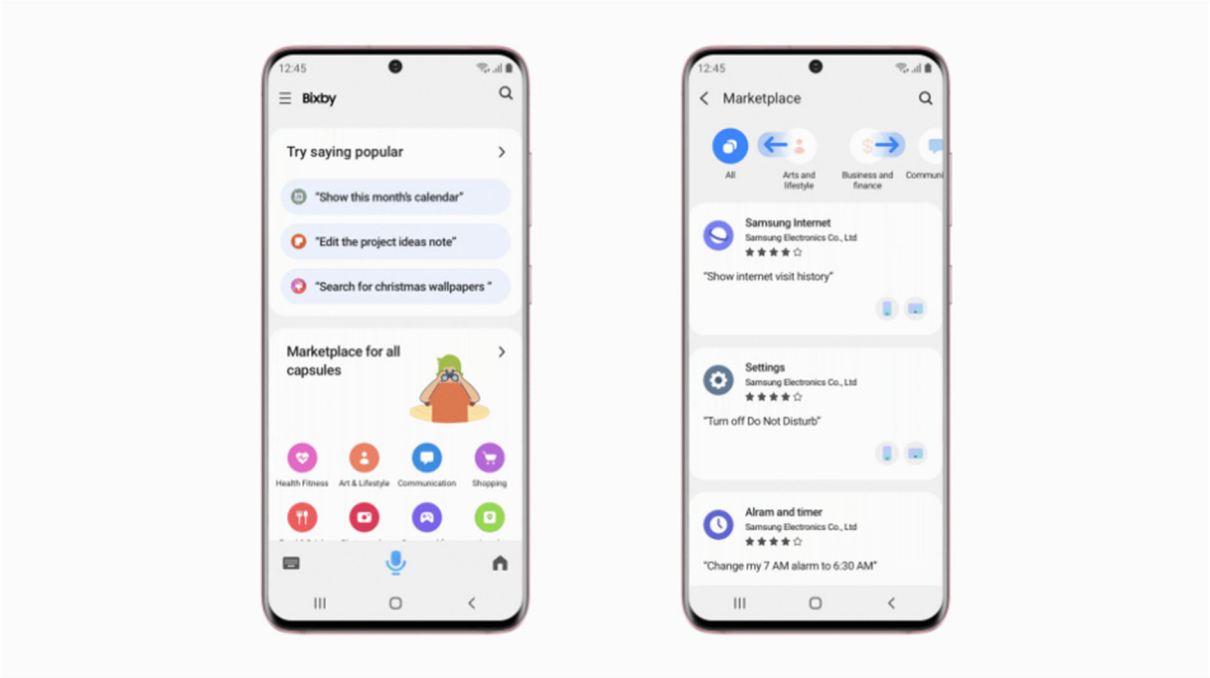
134. Each of the '367 Patent Accused Products comprises a context manager communicatively coupled to a plurality of mobile devices, wherein the context manager includes one or more processors.

135. For example, the Samsung Bixby platform is a context manager communicatively coupled to a plurality of mobile devices. The Samsung Bixby platform is described as communicating across multiple devices that have been registered with Bixby.[28]

[28] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

136. The Samsung Bixby platform further comprises one or more processors, including at least the processors in the device on which Bixby is installed, processors in any microphone accessories linked to the device on which Bixby is installed, and in cloud servers operated by Samsung to process natural language requests from users.

137. Each of the '367 Patent Accused Products comprises registering the plurality of mobile devices with the context manager in response to a registration module associated with the context manager receiving a communication from the plurality of mobile devices.

138. For example, the Samsung Bixby platform registers a plurality of mobile devices to a user's Samsung account associated with the Samsung Bixby platform using a registration module. Samsung describes the user signing into their Samsung account through a mobile device on a Wi-Fi of mobile network in order to use the Samsung Bixby platform.[29]

What is Bixby Voice and how to set up and activate it?

Last Update date : Aug 03. 2022

What is Bixby Voice?

Bixby voice is an intelligent voice assistant that helps you use the device more conveniently.

You can control the device easily by voice command, drastically reducing the required steps.

To use Bixby Voice:

- Your device must be connected to a Wi-Fi or mobile network
- You must sign in to your Samsung account
- Bixby Voice is only available in some languages, and certain features may not be available depending on your region

Please note: This article is applicable to Samsung Mobile Devices such as Galaxy S9/S9+ Note8 and s8/s8+ with Bixby Voice feature.

139. Each of the '367 Patent Accused Products comprises subscribing the plurality of mobile devices registered with the context manager to one or more context events.

140. For example, the Samsung Bixby platform subscribes the registered mobile devices to the Samsung Bixby platform at least in part for the purpose of sharing context events. For example, Samsung Bixby documentation describes a parameter through which a capsule designer can pass information related to a mobile device to a server through the Samsung Bixby platform.[30]

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[29] https://www.samsung.com/sg/support/mobile-devices/what-is-bixby-voice-and-how-to-set-up-and-activate-it-in-samsung-mobile-device/

[30] https://bixbydevelopers.com/dev/docs/dev-guide/release-notes/sdk.2018-Q4-SDK-Release-Notes

> You can now use the `$deviceContext` parameter to pass information related to a user device, including the device model, operating system, OS version, and mobile codes. Read more about Passing Device Context Information in the Developers' Guide.

141. Each of the '367 Patent Accused Products comprises receiving a context input from one or more of the plurality of mobile devices registered with the context manager, wherein the context input includes a context change event.

142. For example, the Samsung Bixby platform receives context inputs from the registered mobile devices on which the platform is used, including context change events. Samsung describes the Samsung Bixby platform as using learning algorithms that determine context based at least in part on previous user interactions with the Samsung Bixby platform.[31]

> components related to context (time and location). Bixby's learning algorithms automatically determine which pieces of context are helpful in picking the best option for a user based on their interactions with the system. This includes, among other things, where and when users made requests, where they made selections, and where they completed transactions.

Samsung further provides a parameter through which a capsule designer can pass information related to a mobile device to a server through the Samsung Bixby platform.[32]

> You can now use the `$deviceContext` parameter to pass information related to a user device, including the device model, operating system, OS version, and mobile codes. Read more about Passing Device Context Information in the Developers' Guide.

143. Each of '367 Patent Accused Products comprises informing the plurality of mobile devices registered with the context manager of the context change event, thereby synchronizing a context across the plurality of mobile devices.

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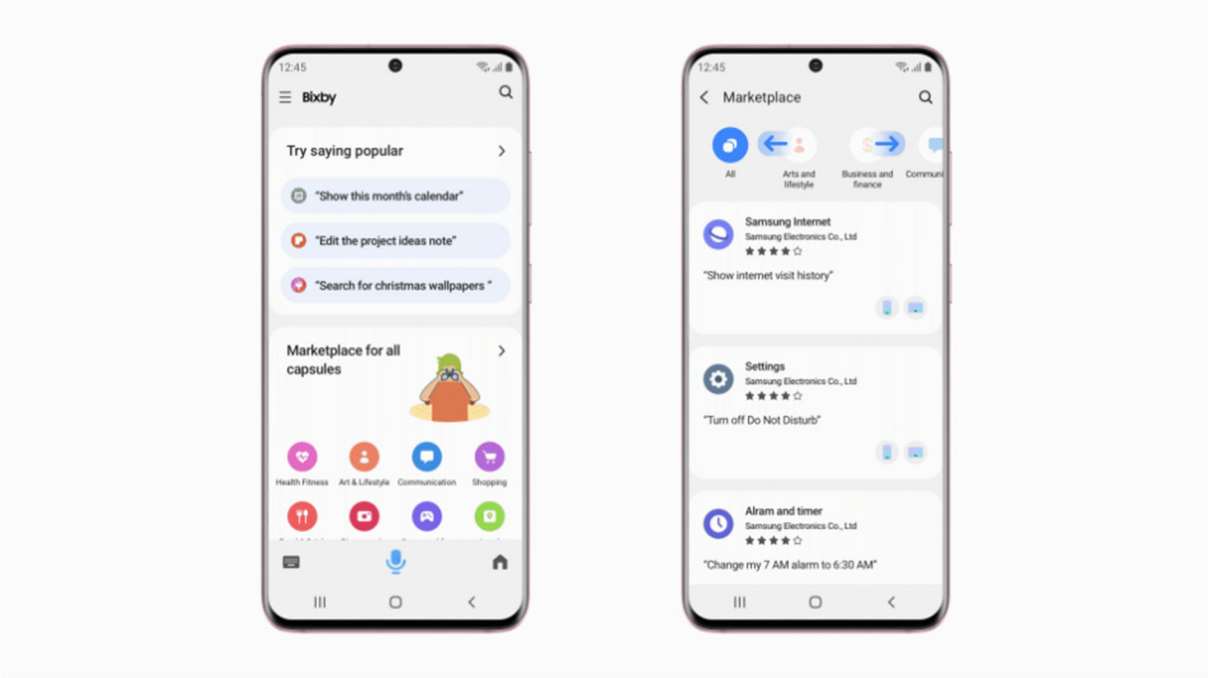
[31] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning
[32] https://bixbydevelopers.com/dev/docs/dev-guide/release-notes/sdk.2018-Q4-SDK-Release-Notes

144. For example, Samsung has described the Samsung Bixby platform as communicating across multiple devices that have been registered with Bixby.[33]

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

[33] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Samsung further describes using the Samsung Bixby platform to manage and coordinate a plurality of mobile and IoT devices to create multi-device experiences.[34]

Intelligent assistance. Wherever. Whenever.

At the heart of it all is Bixby 2.0 - the intelligent assistant that connects you effortlessly to your Samsung devices, inside and outside of the home. Bixby 2.0 is the central hub of your IoT ecosystem that evolves to understand you better and anticipate your needs.

As part of the multi-device experience, Samsung describes switching music seamlessly between devices, which requires synchronizing data regarding the context of that music between devices.[35]

[34] https://www.samsung.com/sg/multi-device-experience/
[35] *Id.*

145. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’367 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

146. Users of the ’367 Patent Accused Products directly infringe at least Claim 1 of the ’367 Patent when they use the ’367 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’367 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’367 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’367 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’367 Patent, or, alternatively, was willfully blind to the infringement.

147. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the ’367 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’367 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’367 Patent, or, alternatively, was willfully blind to the infringement.

148. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or

importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’367 Patent, constituting a material part of the invention. Such components may include but are not limited to mobile devices configured to be registered with the Samsung Bixby platform. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’367 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

149. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’367 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to mobile devices configured to be registered with the Samsung Bixby platform.

150. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the ’367 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

151. Samsung is not licensed or otherwise authorized to practice the claims of the ’367 Patent.

152. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the ’367 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

153. On information and belief, Samsung has known about the ’367 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the ’367 Patent at least as of the filing of this Complaint. Accordingly, Samsung’s infringement of the ’367 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys’ fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

154. As a result of Samsung’s infringement of the ’367 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung’s infringement, but in no event less than a reasonable royalty with interest and costs.

155. On information and belief, Samsung will continue to infringe the ’367 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’367 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

FOURTH COUNT
(Infringement of U.S Patent No. 8,140,327)

156. Dialect incorporates by reference the allegations set forth in Paragraphs 1–155 of the Complaint as though fully set forth herein.

157. The claims of the ’327 Patent are valid and enforceable.

158. The claims of the ’327 Patent are directed to patentable subject matter. Particularly, the ’327 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’327 Patent improve on the natural language processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

159. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’327 Patent, including at least Claim 1 of the ’327 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’327 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform, utilizing two or more microphones, including but not limited to the Samsung Galaxy smartphones version S5 or later and Samsung’s IoT devices including but not limited to the Samsung Galaxy Home Mini and Home Mini 2 (the “’327 Patent Accused Products”).

160. Each of the ’327 Patent Accused Products comprises a system for filtering and eliminating noise from natural language speech utterances, comprising: a microphone array configured to add one or more nulls to a beam pattern steered to point in a direction associated with a user speaking a natural language utterance to capture an input speech signal corresponding to the natural language utterance, wherein the one or more nulls notch out point or limited area noise sources from the input speech signal; an adaptive filter coupled to the microphone array, wherein the adaptive filter is configured to: receive the input speech signal corresponding to the natural language utterance from the microphone array and compare environmental, noise to the

input speech signal to set one or more parameters associated with the adaptive filter; use band shaping and notch filtering to remove narrow-band noise from the input speech signal received from the microphone array according to the one or more parameters; and suppress cross-talk and environmentally caused echoes in the input speech signal received from the microphone array using adaptive echo cancellation; a speech coder arranged between the adaptive filter and a speech recognition engine, wherein the speech coder is configured to receive the input speech signal passed through the adaptive filter and use adaptive lossy audio compression to remove momentary gaps from the input speech signal and variable rate sampling to compress and digitize the input speech signal, wherein the speech coder optimizes the adaptive lossy audio compression and the variable rate sampling to only preserve components in the input speech signal that will be input to the speech recognition engine; and a transceiver configured to communicate the digitized input speech signal from a buffer in the speech coder to the speech recognition engine at a rate that depends on available bandwidth associated with a communication link that connects the transceiver and the speech recognition engine, as specified and claimed by Claim 14 of the '327 Patent.

161. Each of the '327 Patent Accused Products comprises a system for filtering and eliminating noise from natural language speech utterances.

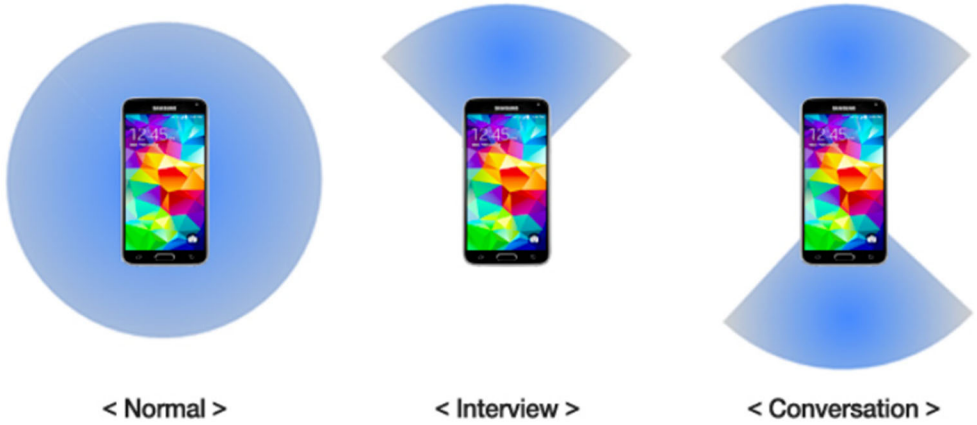
162. For example, on information and belief, the Samsung Galaxy devices since at least the S5 model in 2014 have used two or more microphones, "beam-forming" technology, and filters to eliminate noise from natural language utterances.[36]

[36] https://news.samsung.com/global/galaxy-s5-explained-audio

Stay clear and centred on camera

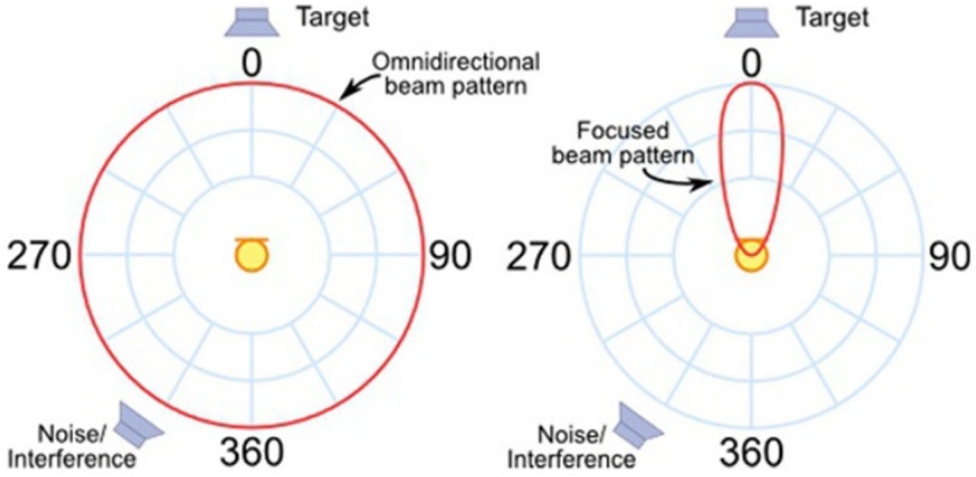
Turn your Tab to landscape mode for a video call and the relocated front camera keeps you in the centre of the screen. When you're talking, your voice comes through clearly with the 3 microphones embedded around the display.

SAMSUNG TOMORROW



▲Beam-forming Patterns by Mode

For this amazing feature, what kind of technology was applied? Samsung has been using two microphones in the phone these days, and it lets the **'Beam-forming' technology** to be enabled. Two microphones form 'sound beams' just like laser beams, and each sound beam records the sound towards the particular direction respectively.



▲Beam-forminig Technology
(Source: http://www.labbookpages.co.uk/audio/beamforming/delaySum.html)

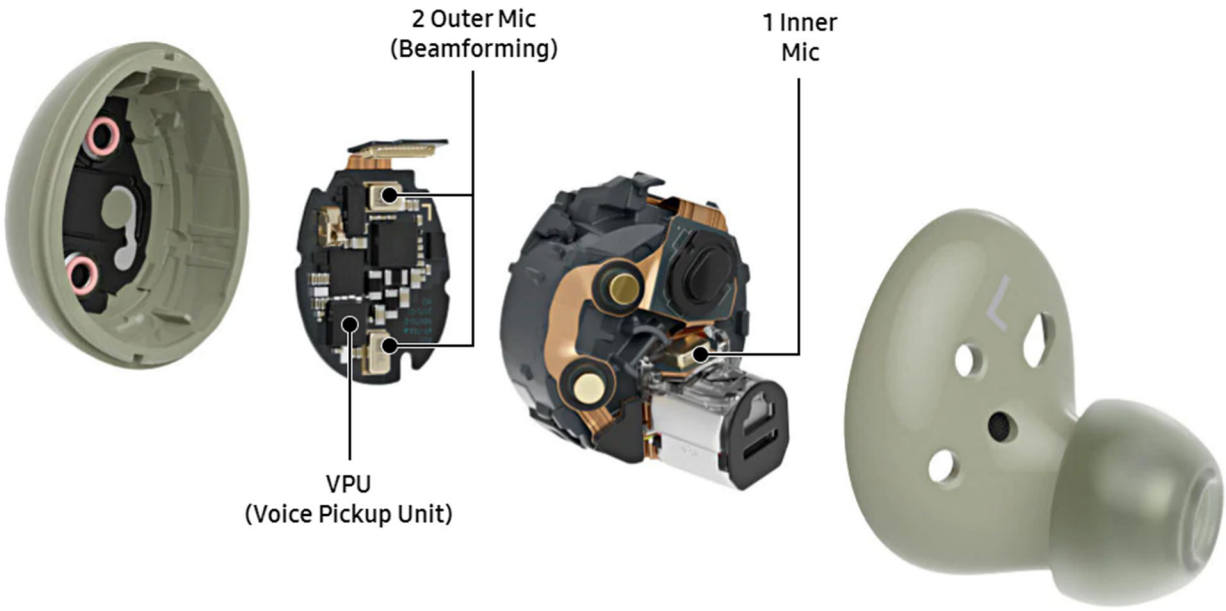
In this way, Directional Voice Recording can selectively record the desired sound while excluding sounds from other directions, only for your specific use. See? The Galaxy S5 even understands your use!

Furthermore, the Samsung Galaxy Buds2 and Buds2 Pro use three microphones and beamforming to capture natural language utterances from a user.[37]

CRYSTAL-CLEAR CALLS

Leave noise out of the conversation

Three microphones and a built-in voice pickup unit help you make clearer calls, while a machine-learning based solution filters unwanted sound so you can better share your world with family and friends. The low protrusion design minimizes wind disruptions to make your outdoors calls come in clear. [2]



163. Similarly, on information and belief, Samsung's home devices, such as the Galaxy Home Mini is a Bixby-powered speaker that features "far-field voice recognition."[38]

[37] https://www.samsung.com/ca/audio-sound/galaxy-buds/galaxy-buds2-graphite-sm-r177nzkaxac/

[38] https://www.sammobile.com/samsung/galaxy-home-mini/

Samsung still hasn't released a lot of technical details about the Galaxy Home Mini so not much is known about the audio capabilities of this device. Given that it is a Bixby-powered smart speaker, it's evidently going to feature far-field voice recognition and the ability to control SmartThings devices.

Far-field voice recognition utilizes one or more microphones, beam-forming, and filtering to recognize a user's voice in a noisy environment.[39]

What is Far-field Voice Control and Speech Recognition

Far-Field Voice Control / Far-Field Technology Speech Recognition Voice Technology

Far-field speech and voice recognition is used to recognize a user's voice in a noisy environment based on speaker localization using microphone arrays. The speaker location is estimated by the direction of arrival method, then noise cancellation and beamforming technologies are applied to separate the target speech signal from noise.

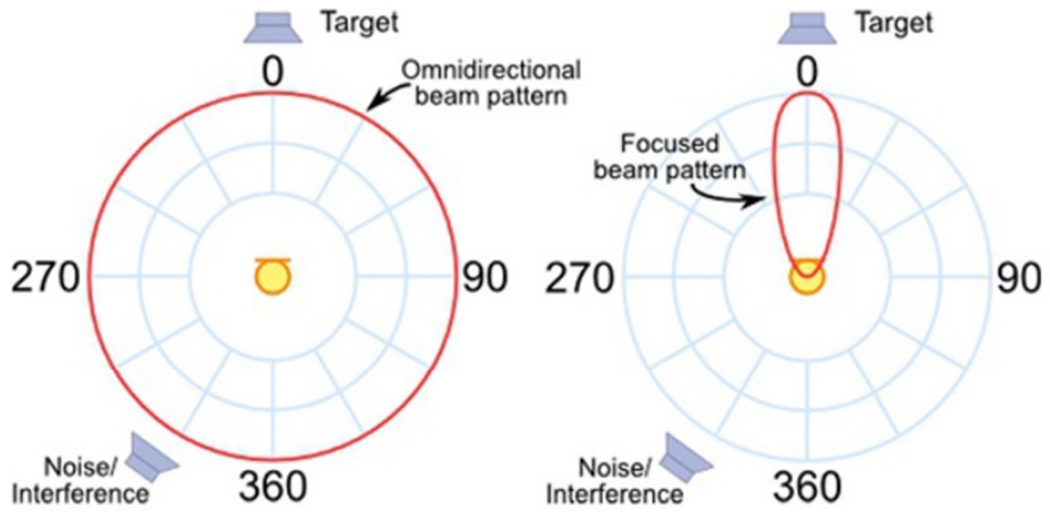
164. Each of the '327 Patent Accused Products comprises a microphone array configured to add one or more nulls to a beam pattern steered to point in a direction associated with a user speaking a natural language utterance to capture an input speech signal corresponding to the natural language utterance, wherein the one or more nulls notch out point or limited area noise sources from the input speech signal.

[39] https://arkxlabs.com/what-is-far-field-voice-speech-and-voice-recognition/

165. For example, on information and belief, Samsung has been using two or more microphones and beam-forming technology in the ’327 Patent Accused Products.[40]

▲Beam-forming Patterns by Mode

For this amazing feature, what kind of technology was applied? Samsung has been using two microphones in the phone these days, and it lets the **‘Beam-forming’ technology** to be enabled. Two microphones form ‘sound beams’ just like laser beams, and each sound beam records the sound towards the particular direction respectively.



▲Beam-forminig Technology
(Source: http://www.labbookpages.co.uk/audio/beamforming/delaySum.html)

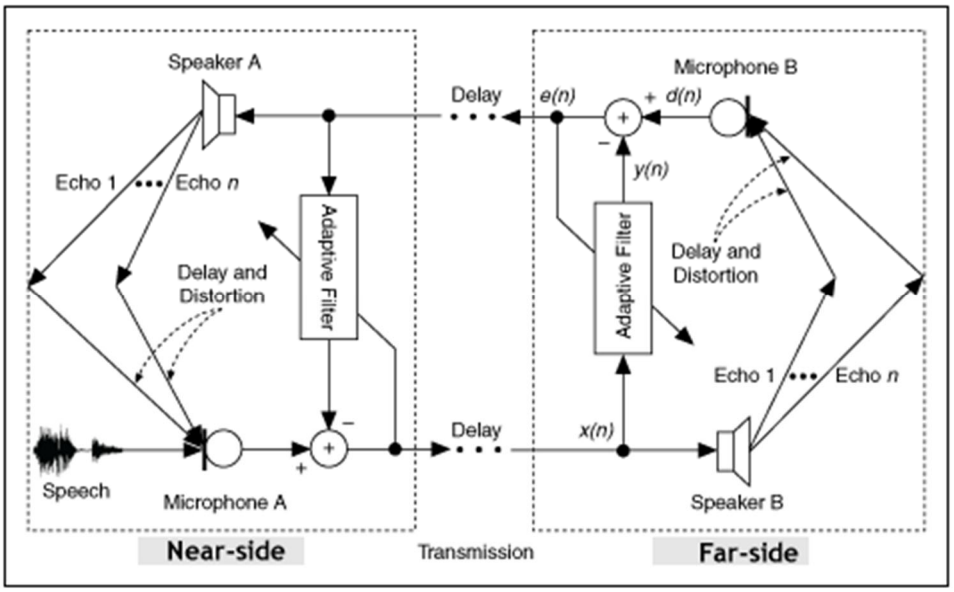
In this way, Directional Voice Recording can selectively record the desired sound while excluding sounds from other directions, only for your specific use. See? The Galaxy S5 even understands your use!

166. Each of the ’327 Patent Accused Products comprises an adaptive filter coupled to the microphone array, wherein the adaptive filter is configured to: receive the input speech signal corresponding to the natural language utterance from the microphone array and compare environmental, noise to the input speech signal to set one or more parameters associated with the adaptive filter.

167. For example, on information and belief, Samsung has used adaptive filters to perform environmental noise cancelation techniques since at least its acquisition of Harman in

[40] https://news.samsung.com/global/samsung-electronics-to-acquire-harman-accelerating-growth-in-automotive-and-connected-technologies

2016.[41] As just one example, Harman uses the capturing of environmental noise as an input to an adaptive filter for acoustic echo cancellation.[42]



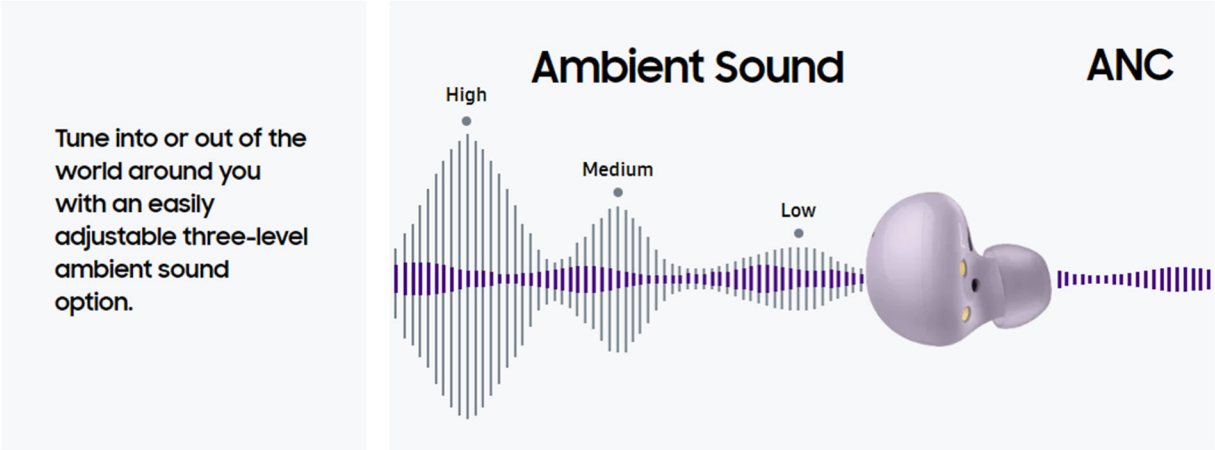
Furthermore, the Galaxy Buds2 include Active Noise Canceling to detect and compare environmental noise to the input signal.[43]

[41] https://www.samsung.com/sg/support/mobile-devices/what-is-bixby-voice-and-how-to-set-up-and-activate-it-in-samsung-mobile-device/

[42] https://audioarchitect.harmanpro.com/en-US/audio-architect-applications_acoustic_echo_cancellation

[43] https://www.samsung.com/ca/audio-sound/galaxy-buds/galaxy-buds2-graphite-sm-r177nzkaxac/

Active Noise Canceling (ANC) On Galaxy Buds2 cuts external background noise by up to 98%, backed by UL Verification



Samsung describes this active noise canceling as filtering out environmental sounds while speaking on the Galaxy Buds.[44]

Wouldn't it be great if your earbuds could automatically detect what you're doing? That's precisely what the Galaxy Buds2 Pro can do for you! With intelligent audio features like Conversation mode, enhanced Ambient mode, and 360 audio, your buds will follow your voice and movements to provide high resolution sounds and call quality. Active noise canceling will also filter out unwanted sounds so you'll never be interrupted when speaking to your friends or enjoying content. You can also use Auto switching to conveniently switch between other Galaxy devices, like your tablet or watch.

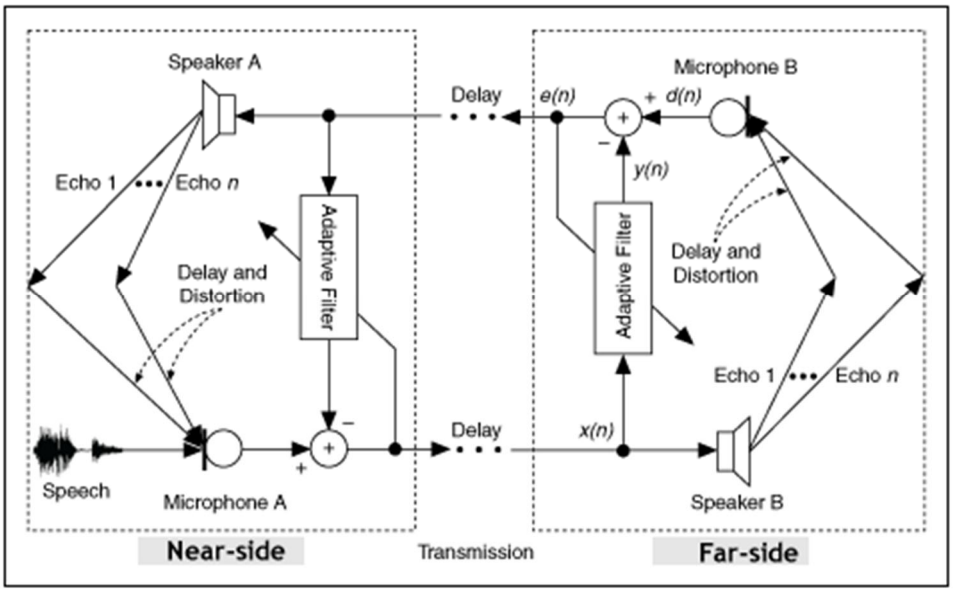
168. On information and belief, each of the '327 Patent Accused Products comprises an adaptive filter configured to use band shaping and notch filtering to remove narrow-band noise from the input speech signal received from the microphone array according to the one or more parameters.

169. Each of the '327 Patent Accused Products comprises an adaptive filter configured to suppress cross-talk and environmentally caused echoes in the input speech signal received from the microphone array using adaptive echo cancellation.

170. For example, on information and belief, Samsung has used an adaptive filter to configured to perform adaptive echo cancelation techniques since at least its acquisition of Harman

[44] https://www.samsung.com/us/support/answer/ANS00091222/

in 2016.[45] As just one example, Harman uses the capturing of environmental noise as an input to an adaptive filter for acoustic echo cancellation.[46]



171. On information and belief, each of '327 Patent Accused Products comprises a speech coder arranged between the adaptive filter and a speech recognition engine, wherein the speech coder is configured to receive the input speech signal passed through the adaptive filter and use adaptive lossy audio compression to remove momentary gaps from the input speech signal and variable rate sampling to compress and digitize the input speech signal, wherein the speech coder optimizes the adaptive lossy audio compression and the variable rate sampling to only preserve components in the input speech signal that will be input to the speech recognition engine.

172. For example, Samsung devices support a variety of adaptive lossy audio codecs to encode input signals.[47]

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[45] https://www.samsung.com/sg/support/mobile-devices/what-is-bixby-voice-and-how-to-set-up-and-activate-it-in-samsung-mobile-device/

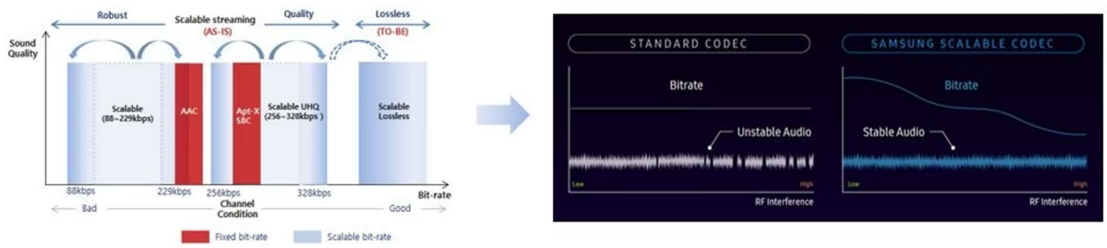
[46] https://audioarchitect.harmanpro.com/en-US/audio-architect-applications_acoustic_echo_cancellation

[47] https://www.soundguys.com/samsung-galaxy-buds-2-60669/

Like the rest of Samsung's earphones, the Galaxy Buds 2 supports a few **Bluetooth codecs**: SBC, AAC, and the Samsung Scalable Codec. The proprietary codec works similarly to **aptX Adaptive**, constantly balancing connection and sound qualities and dynamically adjusting the **bit rate** from 88-512kbps. This makes the Galaxy Buds 2 an excellent choice for Samsung smartphone owners and leaves non-Samsung owners holding the short end of the stick. AAC rates are still **inconsistent** depending on your Android hardware.

Furthermore, Samsung describes the Samsung Scalable Codec is an adaptive lossy audio codec that removes momentary gaps from an input signal.[48]

Scalable Codec prevents audio chopping by analyzing the radio frequency environment and adjusting the bitrate dynamically (from 88kbps to 512kbps).



Furthermore, Samsung describes the Samsung Scalable Codec as being supported by the Samsung mobile devices that support a voice-recognition software platform such as the Samsung Bixby platform.

173. On information and belief, each of '327 Patent Accused Products comprises a transceiver configured to communicate the digitized input speech signal from a buffer in the speech coder to the speech recognition engine at a rate that depends on available bandwidth associated with a communication link that connects the transceiver and the speech recognition engine.

174. For example, the '327 Patent Accused Products comprise one or more transceivers that support one or more wireless protocols, including but not limited to, Wi-Fi and Bluetooth standards.

[48] https://www.samsung.com/in/support/mobile-devices/what-is-scalable-codec

175. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’327 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

176. Users of the ’327 Patent Accused Products directly infringe at least Claim 1 of the ’327 Patent when they use the ’327 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’327 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’327 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’327 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’327 Patent, or, alternatively, was willfully blind to the infringement.

177. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the ’327 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’327 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’327 Patent, or, alternatively, was willfully blind to the infringement.

178. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or

importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’327 Patent, constituting a material part of the invention. Such components may include but are not limited to a speech coder arranged between the adaptive filter and a speech recognition engine, wherein the speech coder is configured to receive the input speech signal passed through the adaptive filter and use adaptive lossy audio compression to remove momentary gaps from the input speech signal and variable rate sampling to compress and digitize the input speech signal. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’327 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

179. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’327 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to a speech coder arranged between the adaptive filter and a speech recognition engine, wherein the speech coder is configured to receive the input speech signal passed through the adaptive filter and use adaptive lossy audio compression to remove momentary gaps from the input speech signal and variable rate sampling to compress and digitize the input speech signal.

180. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the

United States components of the patented invention of at least Claim 1 of the ’327 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

181. Samsung is not licensed or otherwise authorized to practice the claims of the ’327 Patent.

182. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the ’327 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

183. On information and belief, Samsung has known about the ’327 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the ’327 Patent at least as of the filing of this Complaint. Accordingly, Samsung’s infringement of the ’327 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys’ fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

184. As a result of Samsung’s infringement of the ’327 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung’s infringement, but in no event less than a reasonable royalty with interest and costs.

185. On information and belief, Samsung will continue to infringe the ’327 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’327 Patent will

continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

FIFTH COUNT
(Infringement of U.S Patent No. 8,195,468)

186. Dialect incorporates by reference the allegations set forth in Paragraphs 1–185 of the Complaint as though fully set forth herein.

187. The claims of the ’468 Patent are valid and enforceable.

188. The claims of the ’468 Patent are directed to patentable subject matter. Particularly, the ’468 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’468 Patent improve on the natural language recognition of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

189. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’468 Patent, including at least Claim 1 of the ’468 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’468 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’468 Patent Accused Products”).

190. Each of the ’468 Patent Accused Products comprises a mobile device for processing multi-modal natural language inputs, comprising: a conversational voice user interface that receives a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input, the conversational voice user

interface coupled to a transcription module that transcribes the non-speech input to create a non-speech-based transcription; a conversational speech analysis engine that identifies the user that provided the multi-modal natural language input, the conversational speech analysis engine using a speech recognition engine and a semantic knowledge-based model to create a speech-based transcription of the natural language utterance, wherein the semantic knowledge-based model includes a personalized cognitive model derived from one or more prior interactions between the identified user and the mobile device, a general cognitive model derived from one or more prior interactions between a plurality of users and the mobile device, and an environmental model derived from an environment of the identified user and the mobile device; a merging module that merges the speech-based transcription and the non-speech-based transcription to create a merged transcription; a knowledge-enhanced speech recognition engine that identifies one or more entries in a context stack matching information contained in the merged transcription and determines a most likely context for the multi-modal natural language input based on the identified entries; and a response generating module that identifies a domain agent associated with the most likely context for the multi-modal input, communicates a request to the identified domain agent, and generates a response to the user from content provided by the identified domain agent as a result of processing the request., as specified and claimed by Claim 1 of the ’468 Patent.

191. Each of the ’468 Patent Accused Products comprises a mobile device for processing multi-modal natural language inputs.

192. For example, the Samsung Bixby platform is a system for processing multi-modal natural language inputs.

193. Each of the ’468 Patent Accused Products comprises a conversational voice user interface that receives a multi-modal natural language input from a user, the multi-modal natural

language input including a natural language utterance and a non-speech input, the conversational voice user interface coupled to a transcription module that transcribes the non-speech input to create a non-speech-based transcription.

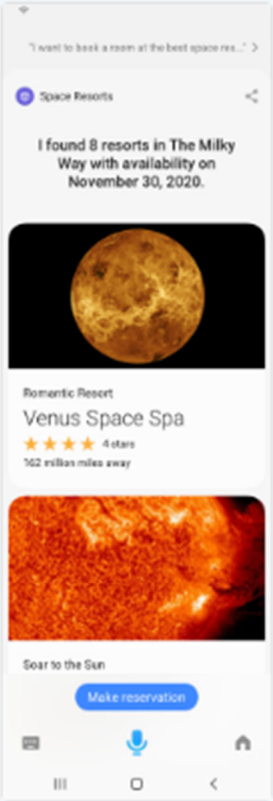
194. For example, the Samsung Bixby platform is a conversational voice user interface that can operate in "hand-on mode" in which the platform receives voice requests and receives non-speech inputs from users, including but not limited to touch navigation or buttons as necessary.[49]

- In **hands-on mode**, Bixby operates as if the user can see and interact with the screen. In this case, Bixby's spoken dialog should be minimal, while the screen (and Bixby Views) shows more robust information, with touch navigation or buttons if necessary.

Furthermore, in hands-on mode, the Samsung Bixby platform allows the user to tap cards in a list to create inputs for the platform.[50]

[49] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde
[50] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde

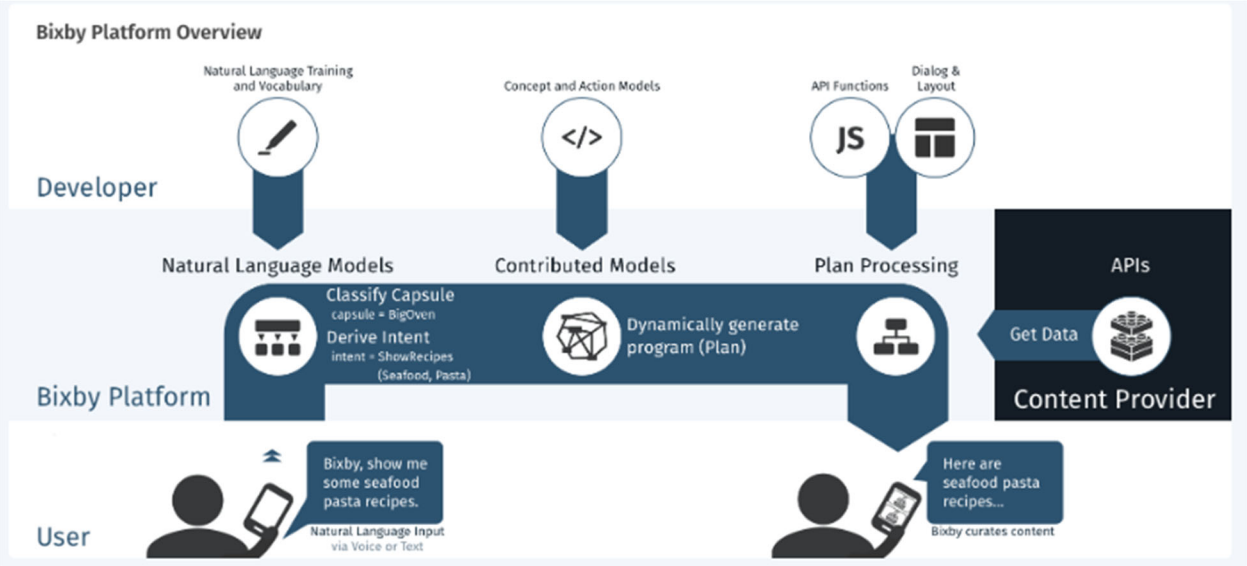
In Bixby Views, it shows a Result Moment with a List View.



The user can tap the first card in the list.

Furthermore, the Samsung Bixby includes natural language models to generate a transcription based on the natural language input.[51]

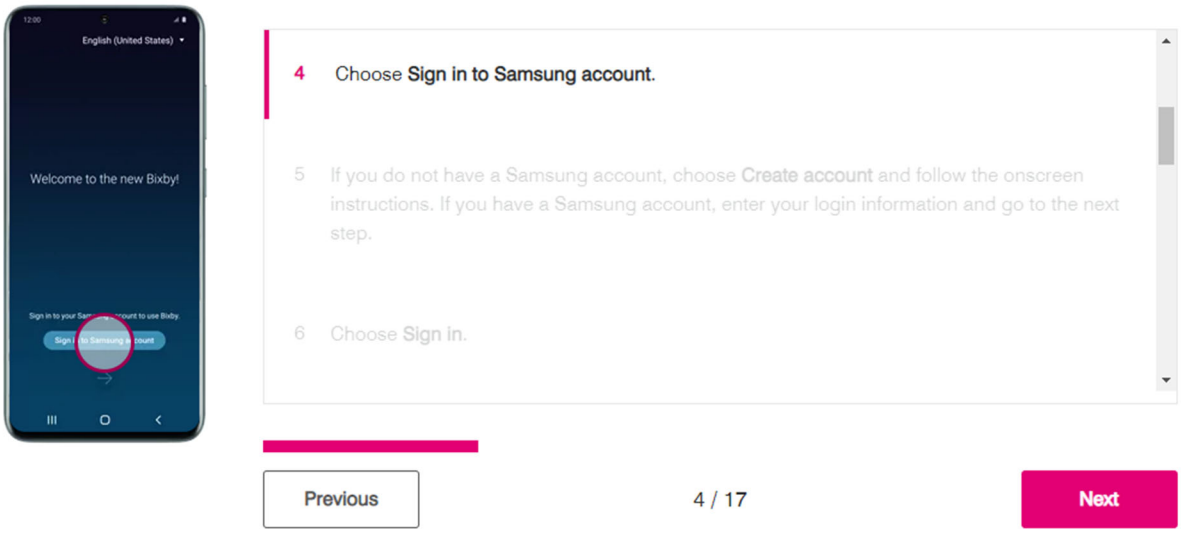
[51] https://bixbydevelopers.com/dev/docs/get-started/overview



195. Each of the '468 Patent Accused Products comprises a conversational speech analysis engine that identifies the user that provided the multi-modal natural language input, the conversational speech analysis engine using a speech recognition engine and a semantic knowledge-based model to create a speech-based transcription of the natural language utterance, wherein the semantic knowledge-based model includes a personalized cognitive model derived from one or more prior interactions between the identified user and the mobile device, a general cognitive model derived from one or more prior interactions between a plurality of users and the mobile device, and an environmental model derived from an environment of the identified user and the mobile device.

196. For example, the Samsung Bixby platform includes natural language models that create a speech-based transcription of the natural language utterance. Moreover, the Samsung Bixby platform is personalized to the user and requires the user to login to a Samsung account to identify that user.[52]

[52] https://www.t-mobile.com/support/tutorials/device/samsung/galaxy-s20-5g/topic/apps-amp-accessories/how-to-set-up-bixby/4

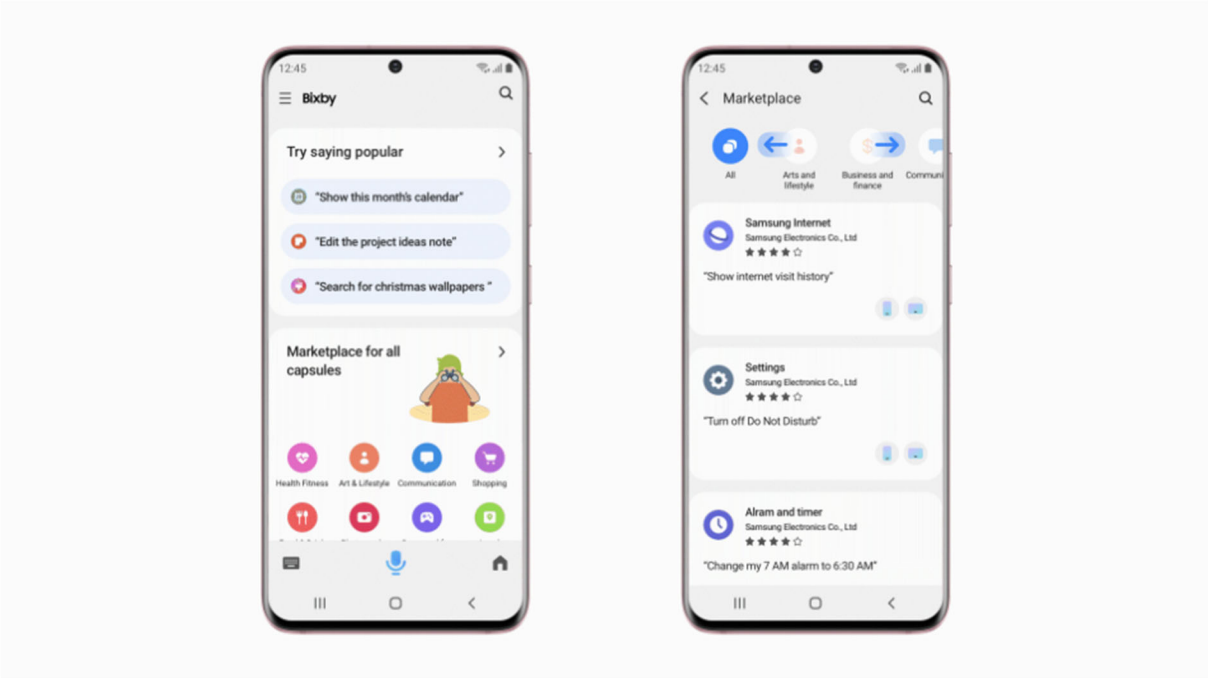


Furthermore, Samsung describes the Samsung Bixby platform as using prior usage patterns on the requested device or other devices registered with Bixby associated with that user.[53]

[53] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

Furthermore, Samsung describes the Bixby platform as using personalization and learning that Bixby can use to learn about its users and the world generally.[54]

[54] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning

Personalization and Learning

With personalization and learning, you can better create capabilities that cater to the habits and routines of users. The models you create for your capsule provide structure to your experience that Bixby can use to learn about its users and the world.

Bixby can learn a lot about users based on their interactions with your capsule. For example, imagine that the user states, “Find me a hotel in Chicago.” The user then chooses “Chicago, IL”. Bixby learns that the user means "Chicago, IL". The user then adds a follow-up request that states, “Hotels with parking.” In this case, Bixby learns that the user has a preference for hotels with parking. Finally, as part of that conversation the user chooses and books “The Drake Hotel / Standard Room, 1 Queen Bed” from a list of results. Bixby learns here that the user likes queen beds when looking for hotel rooms. With each interaction, Bixby is able to automatically learn about the user and your capsule to help them get things done.

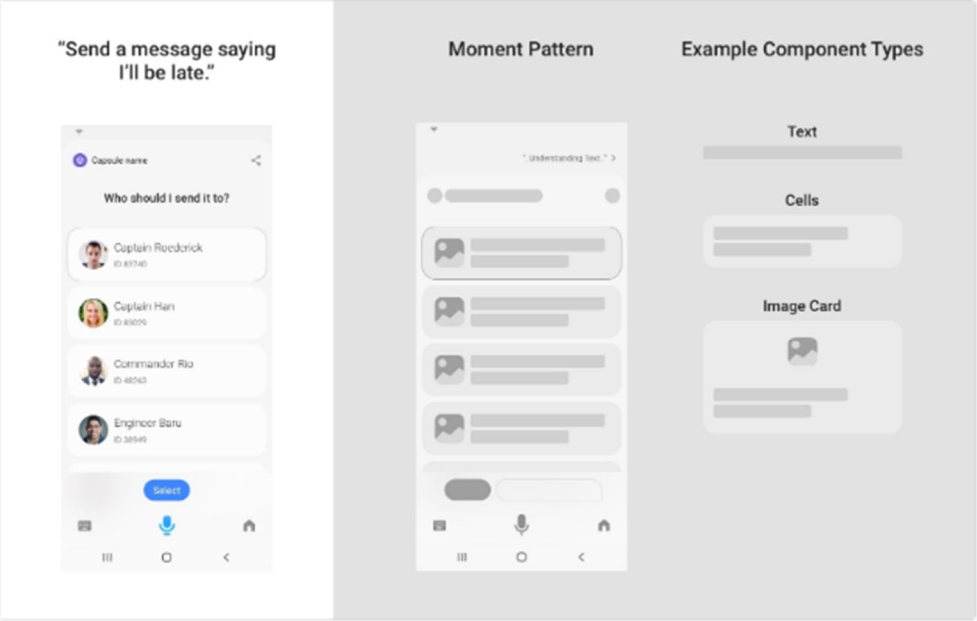
Furthermore, Samsung describes the Samsung Bixby platform as providing multi-modal inputs to the user based on “choices that the user has frequently selected in the past.”[55]

[55] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/service.Input#selection

Selection

Use a Selection Prompt when the user can choose an input from a finite and specific list provided by your service. These are also useful when disambiguating between very similar choices.

The ordering of a Selection list can be determined with selection learning. The top few items of the list can be choices that the user has frequently selected in the past, allowing the user to make the right choice quickly.



Samsung describes Bixby as automatically learning what a specific user likes to select, as well as what users like to select in general.[56]

Bixby automatically learns what a specific user likes to select, as well as what users like to select in general. The more Bixby knows about a specific user based on their past selections, preferences, and context, the more likely it will automatically make a personalized selection. New users, however, are more likely to see Bixby automatically choose the best selection based on what it has learned from interactions of all users. For example, if the majority of people select "Dublin, IE" when users request "Weather in Dublin", Bixby starts to learn that the factors of why Dublin, IE was selected. If that is not what a user wanted to be selected, they can always change the selection that Bixby makes. Doing so also teaches Bixby about the user's preferences as well as what is generally the best selection for that context. Ultimately if Bixby is unsure about what option to select it will default to the first result that you as the developer provide or prompt the user.

[56] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning

Additionally, Samsung provides a sample of code for a Bixby platform capsule that expressly identifies multi-modal inputs based on the user's past behavior.[57]

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e present them in a list of summary items

 user with a more prominent layout

ce learning to present a personalized recommendation based on the user's past behavior
ES)
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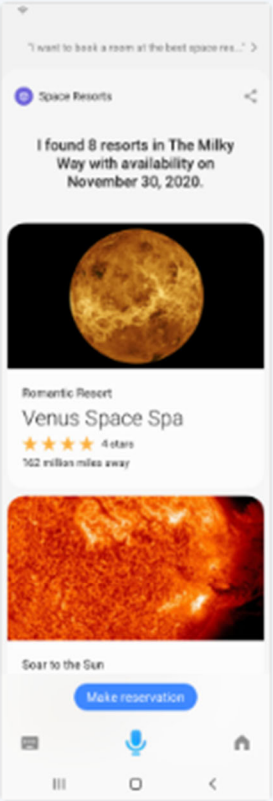
197. Each of '468 Patent Accused Products comprises a merging module that merges the speech-based transcription and the non-speech-based transcription to create a merged transcription.

198. For example, in hands-on mode, the Samsung Bixby platform allows the user to tap cards in a list to merge the spoken request with the tapped information.[58]

[57] https://bixbydevelopers.com/dev/docs/sample-capsules/walkthroughs/space-resorts
[58] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde

In Bixby Views, it shows a Result Moment with a List View.

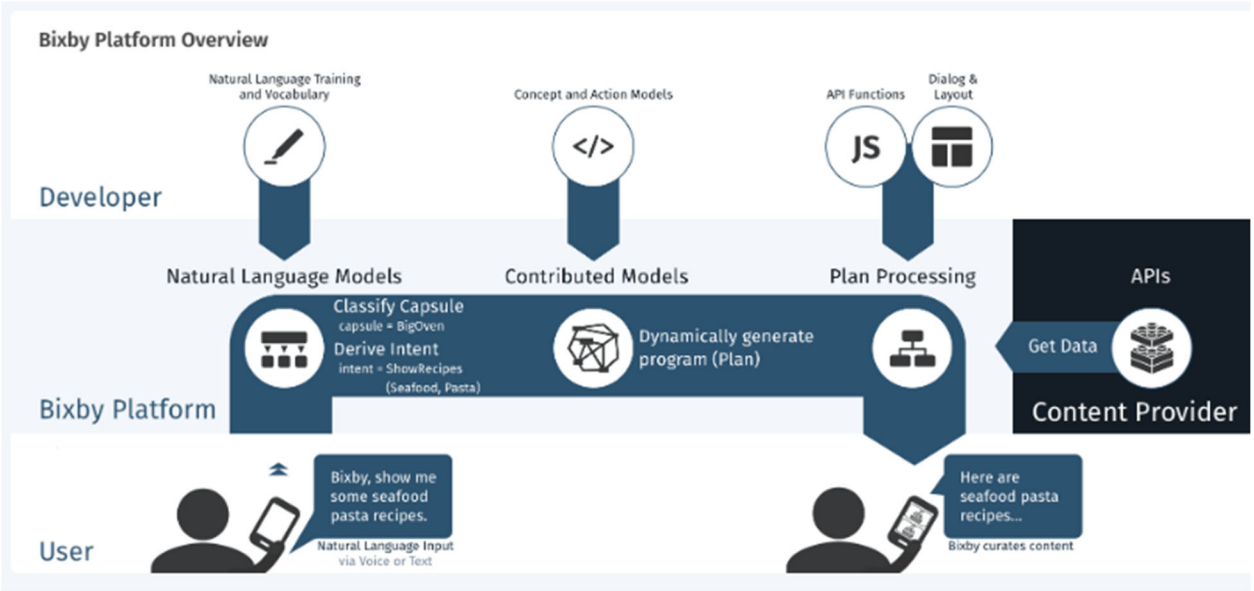


The user can tap the first card in the list.

199. Each of '468 Patent Accused Products comprises a knowledge-enhanced speech recognition engine that identifies one or more entries in a context stack matching information contained in the merged transcription and determines a most likely context for the multi-modal natural language input based on the identified entries.

200. The Samsung Bixby Platform is described as "Classify[ing] Capsules," which requires the platform to identify the appropriate context from the information in the transcription for the selection of the appropriate capsule.[59]

[59] https://bixbydevelopers.com/dev/docs/get-started/overview



For example, Samsung describes Selection Learning as a method for Bixby to learn the most context-aware and personalized selection behavior for each user.[60]

Selection Learning and Selection Rules

You can enable Selection Learning as well as Selection Rules for action inputs. At any time, you can add Learning, Selection Rules, or both to improve and personalize the users experience. When you enable Selection Learning, Bixby references it first to see if it has learned the best options to select for a user. At that point, Bixby will determine one of the following:

- Selection Learning is confident about the options to automatically select for the user. In this case, execution uses these options and Selection Rules, if specified, are not referenced. Bixby also does not prompt the user.
- Selection Learning is **not** confident about what to select for the user. In this case, execution will reference Selection Rules, if specified. If at least one Selection Rule is specified, an option is **always** selected automatically for the user. If no rules exist, Bixby prompts the user.

So when should you add Selection Learning, Selection Rules, or both? Selection Rules are a great way for you to encode selection default behavior. Rules provide a way to deterministically choose the best options for **all** users. An action input with only rules will not learn different selections based on context, nor will it learn different, personalized behavior for each user. In order for Bixby to learn the most context-aware and personalized selection behavior, you should enable Selection Learning and specify Selection Strategies to help Bixby learn your prompts.

[60] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning

Furthermore, Samsung describes selection as encompassing multi-modal inputs such as a full-screen Selection List component.[61]

selection-of

optional value required

Generates a full-screen Selection List component that enables users to select one or more items in a given list using the `selection-of` key in `input-view`. This is also known as the **value picker** in the Design Guides. Only card components can be in a `selection-of` list.

Note

Customizable text for the `submit-button` is only available for multi-selection of items in `selection-of`. No button is displayed for users when selecting a single value.

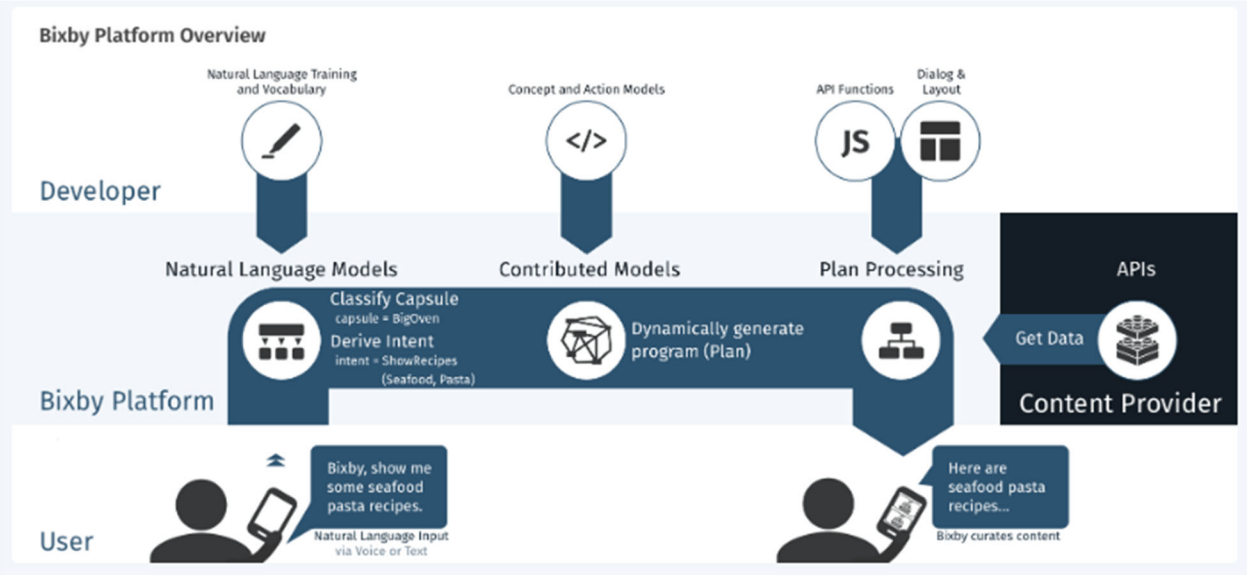
If you want to display the details of an item after a user taps it, make sure to define the `on-click` key with a `view-for` that maps it to the details layout. The user can then choose to select that item on the details page by tapping on the Select button.

If you allow multi-selection and set an `on-click` on cards within the list, the `on-click` definition will be ignored.

201. Each of '468 Patent Accused Products comprises a response generating module that identifies a domain agent associated with the most likely context for the multi-modal input, communicates a request to the identified domain agent, and generates a response to the user from content provided by the identified domain agent as a result of processing the request.

202. For example, the Samsung Bixby platform includes a parser that determines a context for the transcript select one of the plurality of capsules that is configured to receive, process and respond to the request.[62]

[61] https://bixbydevelopers.com/dev/docs/reference/type/input-view.render.selection-of
[62] https://bixbydevelopers.com/dev/docs/get-started/overview



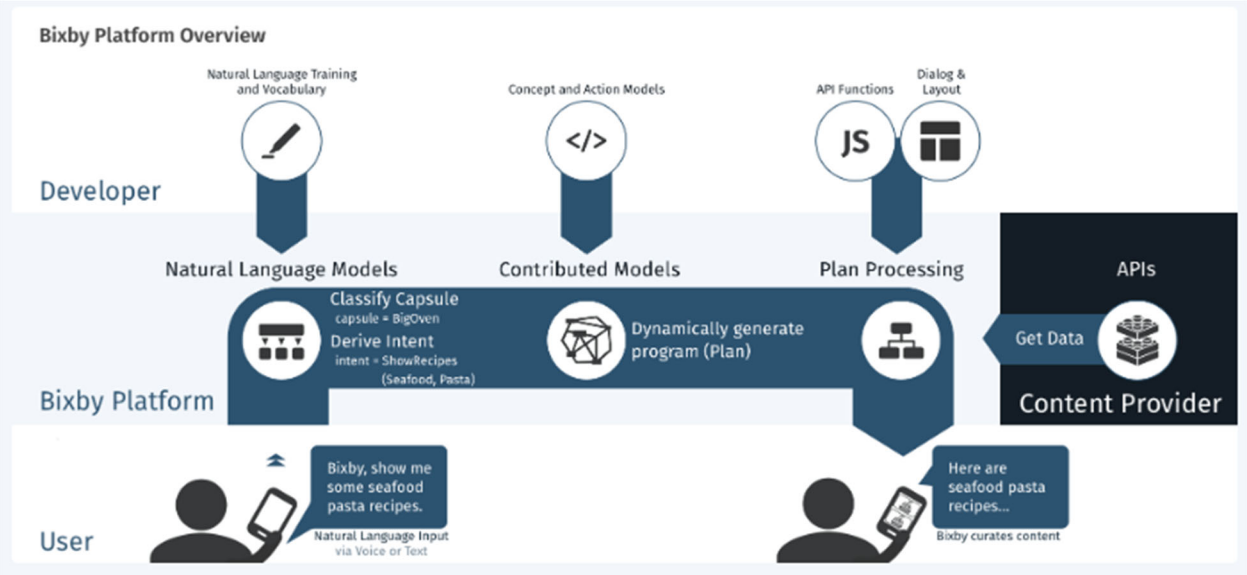
The Samsung Bixby platform is further described as identifying the relevant capsule based on the context determined by the natural language input.[63]

> Keep in mind that, when Bixby receives a user request, it attempts to identify a relevant capsule or gives low confidence if no capsules are relevant (such as if the user gives a random or garbage request). Once a capsule is chosen, Bixby then tries to identify the most relevant goal for the utterance. If there is only one goal in your capsule, then that is considered the *best* goal. You are restricted to testing only your capsule, so strive to ensure your capsule addresses all of the utterances for your use cases. While testing, you should not have to worry about extraneous utterances matching your capsule as those will not be the case with your users.

Furthermore, the Samsung Bixby platform communicates the derived intent to one of the plurality of capsules that is configured to receive, process and respond to the request.[64]

[63] https://bixbydevelopers.com/dev/docs/dev-guide/developers/customizing-plan.planner-overview

[64] https://bixbydevelopers.com/dev/docs/get-started/overview



203. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’468 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

204. Users of the ’468 Patent Accused Products directly infringe at least Claim 1 of the ’468 Patent when they use the ’468 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’468 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’468 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’468 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’468 Patent, or, alternatively, was willfully blind to the infringement.

205. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement,

knowingly inducing customers to commit acts of infringement with respect to the ’468 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’468 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’468 Patent, or, alternatively, was willfully blind to the infringement.

206. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’468 Patent, constituting a material part of the invention. Such components may include but are not limited to processors configured to process multi-modal natural language inputs from a user. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’468 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

207. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’468 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to processors configured to process multi-modal natural language inputs from a user.

208. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung's infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the '468 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

209. Samsung is not licensed or otherwise authorized to practice the claims of the '468 Patent.

210. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '468 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

211. On information and belief, Samsung has known about the '468 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the '468 Patent at least as of the filing of this Complaint. Accordingly, Samsung's infringement of the '468 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

212. As a result of Samsung's infringement of the '468 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung's infringement, but in no event less than a reasonable royalty with interest and costs.

213. On information and belief, Samsung will continue to infringe the ’468 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’468 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

SIXTH COUNT
(Infringement of U.S Patent No. 8,447,607)

214. Dialect incorporates by reference the allegations set forth in Paragraphs 1–213 of the Complaint as though fully set forth herein.

215. The claims of the ’607 Patent are valid and enforceable.

216. The claims of the ’607 Patent are directed to patentable subject matter. Particularly, the ’607 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’607 Patent improve on the natural language recognition of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

217. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’607 Patent, including at least Claim 1 of the ’607 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’607 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’607 Patent Accused Products”).

218. Each of the ’607 Patent Accused Products comprises a device for processing natural language inputs, comprising one or more processors configured to: receive a multi-modal natural

language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input; generate a non-speech transcription from the non-speech input; identify the user who provided the multi-modal natural language input; generate a speech-based transcription based on a cognitive model associated with the user, wherein the cognitive model includes information on one or more prior interactions between the user and the device; generate a merged transcription from the speech-based transcription and the non-speech transcription; identify, from among a plurality of entries that are in a context stack and that are each indicative of context, an entry in the context stack that matches information in the merged transcription; identify a domain agent associated with the entry in the context stack; determine a request based on the merged transcription; and communicate the request to the domain agent, wherein the domain agent is configured to generate a response to the user, as specified and claimed by Claim 1 of the ’607 Patent.

219. Each of the ’607 Patent Accused Products comprises a device for processing natural language inputs, comprising one or more processors.

220. For example, the Samsung Bixby platform is a system for processing natural language inputs. The Samsung Bixby platform further comprises one or more processors, including at least the processors in the device on which Bixby is installed, processors in any microphone accessories linked to the device on which Bixby is installed, and in cloud servers operated by Samsung to process natural language requests from users.

221. Each of the ’607 Patent Accused Products comprises receiving a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input.

222. For example, the Samsung Bixby platform can operate in "hand-on mode" in which the platform receives voice requests and receives non-speech inputs from users, including but not limited to touch navigation or buttons as necessary.[65]

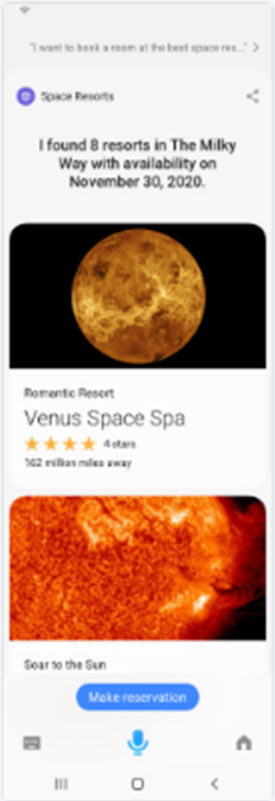
- In **hands-on mode**, Bixby operates as if the user can see and interact with the screen. In this case, Bixby's spoken dialog should be minimal, while the screen (and Bixby Views) shows more robust information, with touch navigation or buttons if necessary.

223. Each of the '607 Patent Accused Products comprises generating a non-speech transcription from the non-speech input.

224. For example, in hands-on mode, the Samsung Bixby platform allows the user to tap cards in a list to create inputs for the platform.[66]

[65] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde
[66] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde

In Bixby Views, it shows a Result Moment with a List View.

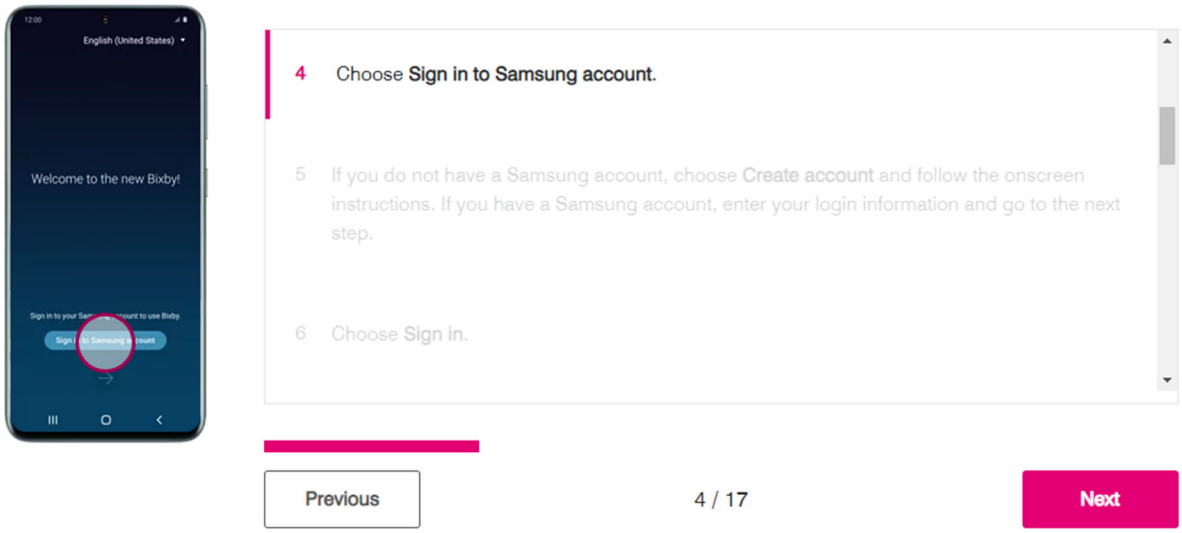


The user can tap the first card in the list.

225. Each of the '607 Patent Accused Products comprises identifying the user who provided the multi-modal natural language input.

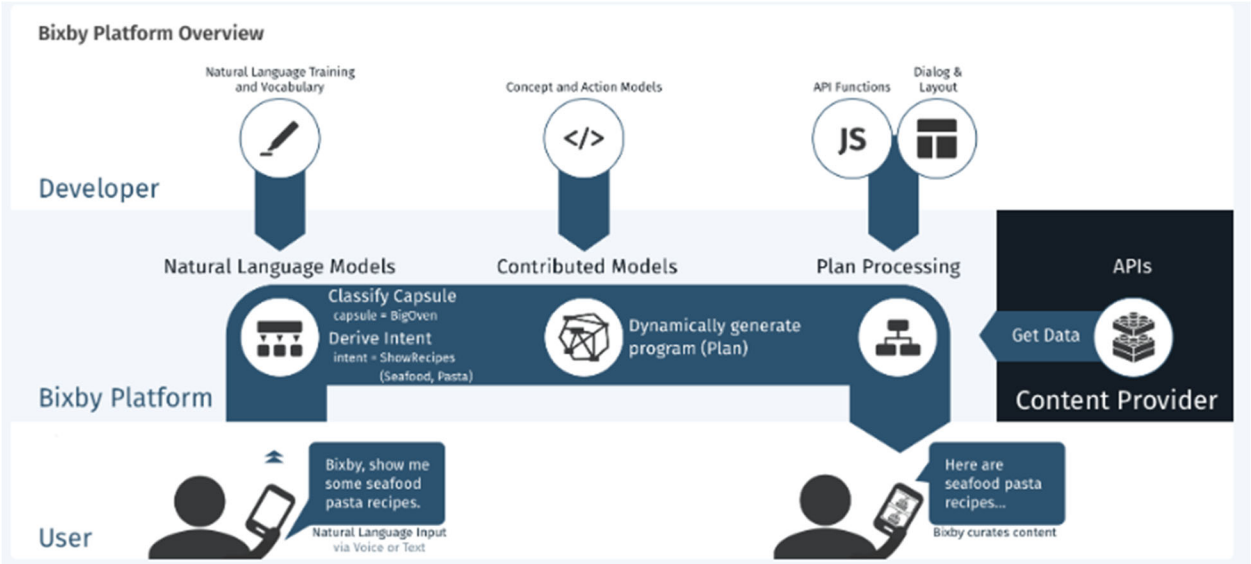
226. For example, the Samsung Bixby platform is personalized to the user and requires the user to login to a Samsung account to identify that user.[67]

[67] https://www.t-mobile.com/support/tutorials/device/samsung/galaxy-s20-5g/topic/apps-amp-accessories/how-to-set-up-bixby/4



227. Each of the '607 Patent Accused Products comprises generating a speech-based transcription based on a cognitive model associated with the user, wherein the cognitive model includes information on one or more prior interactions between the user and the device.

228. For example, the Samsung Bixby platform uses natural language models to generate a transcription based on the natural language input.[68]

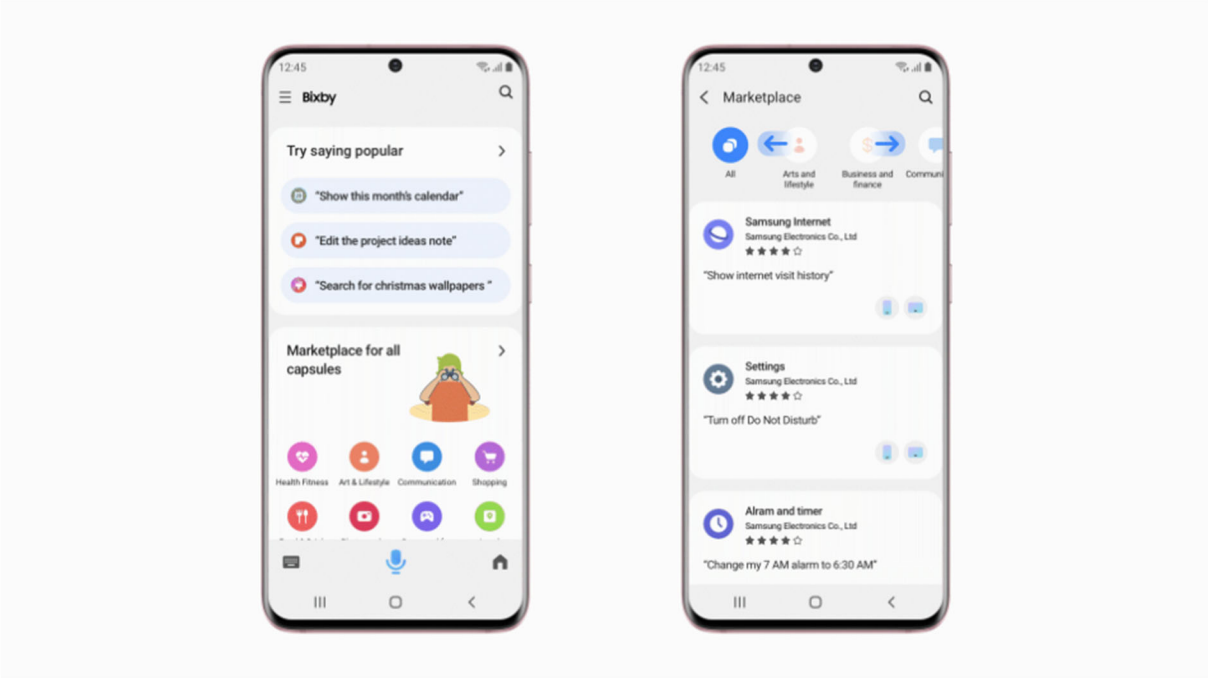


[68] https://bixbydevelopers.com/dev/docs/get-started/overview

Furthermore, Samsung describes the Samsung Bixby platform as using prior usage patterns on the requested device or other devices registered with Bixby associated with that user.[69]

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

Furthermore, Samsung describes the Bixby platform as using personalization and learning that Bixby can use to learn about its users and the world generally.[70]

[69] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

[70] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning

Personalization and Learning

With personalization and learning, you can better create capabilities that cater to the habits and routines of users. The models you create for your capsule provide structure to your experience that Bixby can use to learn about its users and the world.

Bixby can learn a lot about users based on their interactions with your capsule. For example, imagine that the user states, “Find me a hotel in Chicago.” The user then chooses “Chicago, IL”. Bixby learns that the user means "Chicago, IL". The user then adds a follow-up request that states, “Hotels with parking.” In this case, Bixby learns that the user has a preference for hotels with parking. Finally, as part of that conversation the user chooses and books “The Drake Hotel / Standard Room, 1 Queen Bed” from a list of results. Bixby learns here that the user likes queen beds when looking for hotel rooms. With each interaction, Bixby is able to automatically learn about the user and your capsule to help them get things done.

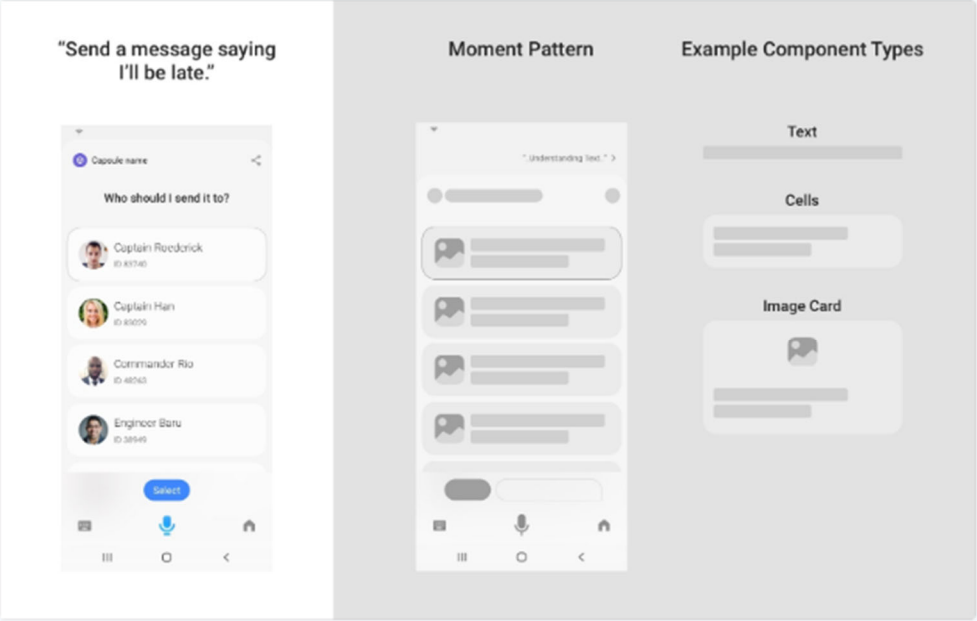
Furthermore, Samsung describes the Samsung Bixby platform as providing multi-modal inputs to the user based on “choices that the user has frequently selected in the past.”[71]

[71] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/service.Input#selection

Selection

Use a Selection Prompt when the user can choose an input from a finite and specific list provided by your service. These are also useful when disambiguating between very similar choices.

The ordering of a Selection list can be determined with selection learning. The top few items of the list can be choices that the user has frequently selected in the past, allowing the user to make the right choice quickly.



Samsung describes Bixby as automatically learning what a specific user likes to select, as well as what users like to select in general.[72]

Bixby automatically learns what a specific user likes to select, as well as what users like to select in general. The more Bixby knows about a specific user based on their past selections, preferences, and context, the more likely it will automatically make a personalized selection. New users, however, are more likely to see Bixby automatically choose the best selection based on what it has learned from interactions of all users. For example, if the majority of people select "Dublin, IE" when users request "Weather in Dublin", Bixby starts to learn that the factors of why Dublin, IE was selected. If that is not what a user wanted to be selected, they can always change the selection that Bixby makes. Doing so also teaches Bixby about the user's preferences as well as what is generally the best selection for that context. Ultimately if Bixby is unsure about what option to select it will default to the first result that you as the developer provide or prompt the user.

[72] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning

Additionally, Samsung provides a sample of code for a Bixby platform capsule that expressly identifies multi-modal inputs based on the user's past behavior.[73]

```
e present them in a list of summary items

 user with a more prominent layout

ce learning to present a personalized recommendation based on the user's past behavior
ES)
```

229. Each of '607 Patent Accused Products comprises generating a merged transcription from the speech-based transcription and the non-speech transcription.

230. For example, in hands-on mode, the Samsung Bixby platform allows the user to tap cards in a list to merge the spoken request with the tapped information.[74]

[73] https://bixbydevelopers.com/dev/docs/sample-capsules/walkthroughs/space-resorts
[74] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/how-to-design.hef-mde

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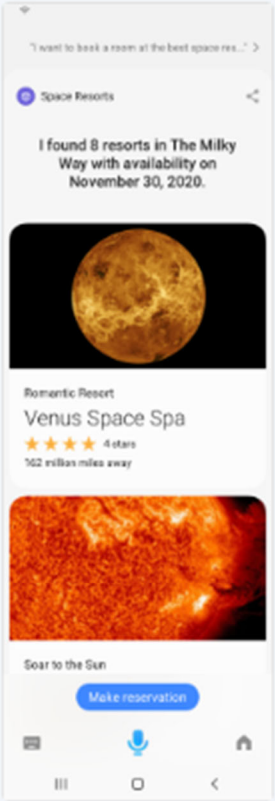
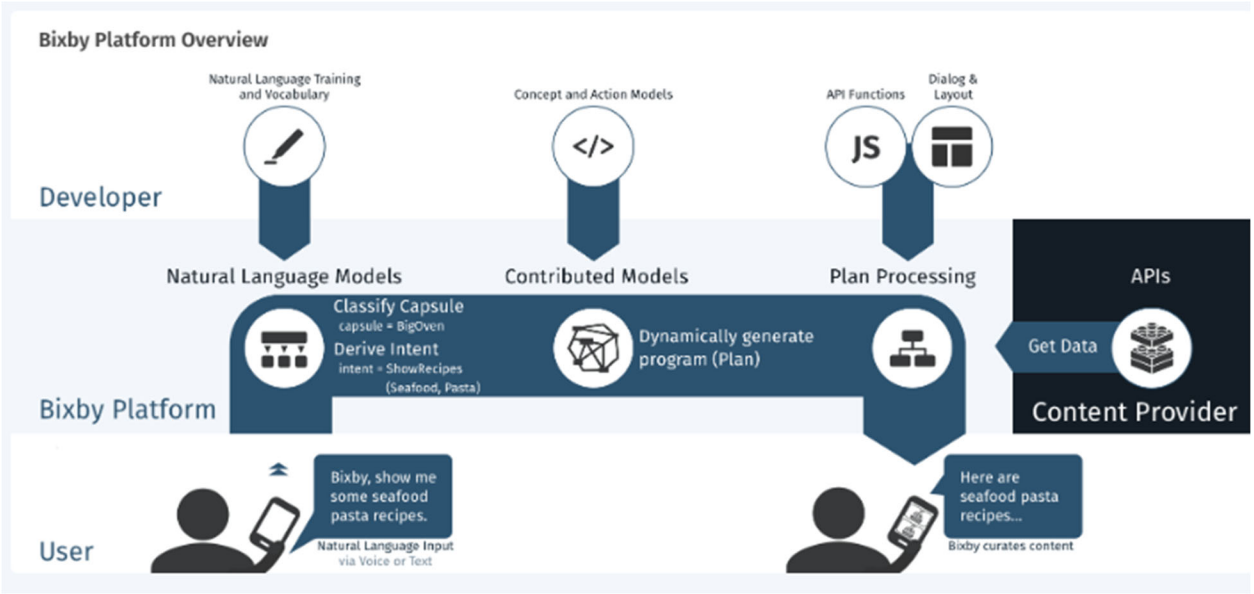


The user can tap the first card in the list.

231. Each of '607 Patent Accused Products comprises identifying, from among a plurality of entries that are in a context stack and that are each indicative of context, an entry in the context stack that matches information in the merged transcription.

232. The Samsung Bixby Platform is described as "Classify[ing] Capsules," which requires the platform to identify the appropriate context from the information in the transcription for the selection of the appropriate capsule.[75]

[75] https://bixbydevelopers.com/dev/docs/get-started/overview



For example, Samsung describes Selection Learning as a method for Bixby to learn the most context-aware and personalized selection behavior for each user.[76]

Selection Learning and Selection Rules

You can enable Selection Learning as well as Selection Rules for action inputs. At any time, you can add Learning, Selection Rules, or both to improve and personalize the users experience. When you enable Selection Learning, Bixby references it first to see if it has learned the best options to select for a user. At that point, Bixby will determine one of the following:

- Selection Learning is confident about the options to automatically select for the user. In this case, execution uses these options and Selection Rules, if specified, are not referenced. Bixby also does not prompt the user.
- Selection Learning is **not** confident about what to select for the user. In this case, execution will reference Selection Rules, if specified. If at least one Selection Rule is specified, an option is **always** selected automatically for the user. If no rules exist, Bixby prompts the user.

So when should you add Selection Learning, Selection Rules, or both? Selection Rules are a great way for you to encode selection default behavior. Rules provide a way to deterministically choose the best options for **all** users. An action input with only rules will not learn different selections based on context, nor will it learn different, personalized behavior for each user. In order for Bixby to learn the most context-aware and personalized selection behavior, you should enable Selection Learning and specify Selection Strategies to help Bixby learn your prompts.

[76] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning

Furthermore, Samsung describes selection as encompassing multi-modal inputs such as a full-screen Selection List component.[77]

selection-of

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Generates a full-screen Selection List component that enables users to select one or more items in a given list using the `selection-of` key in `input-view`. This is also known as the **value picker** in the Design Guides. Only card components can be in a `selection-of` list.

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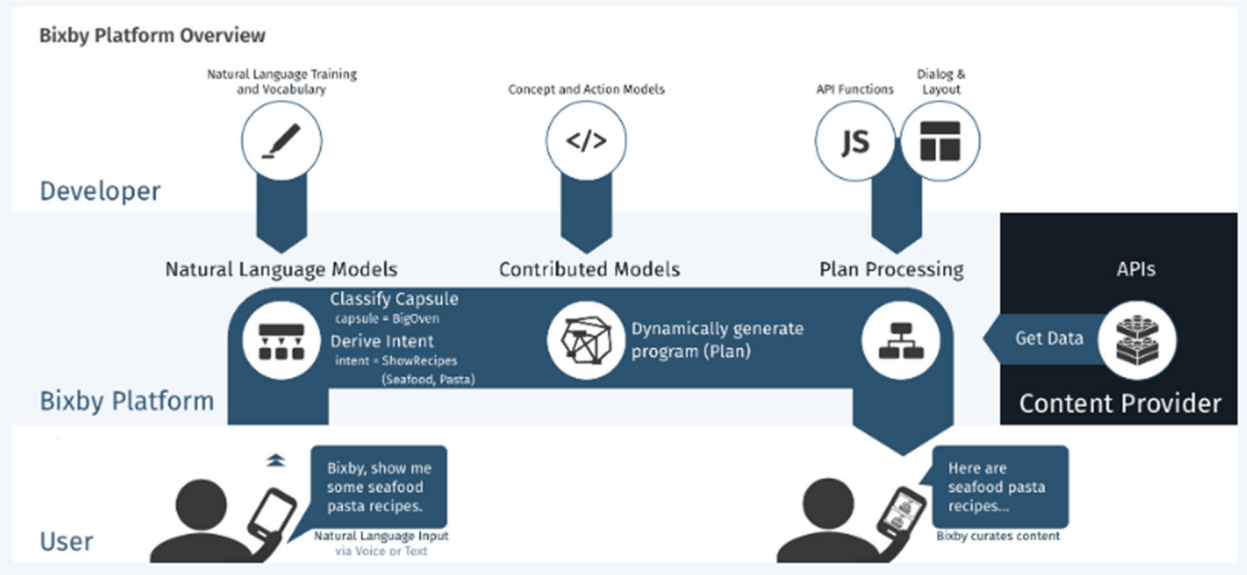
234. For example, the Samsung Bixby platform includes a parser that determines a context for the transcript select one of the plurality of capsules that is configured to receive, process and respond to the request.[78]

[77] https://bixbydevelopers.com/dev/docs/reference/type/input-view.render.selection-of
[78] https://bixbydevelopers.com/dev/docs/get-started/overview



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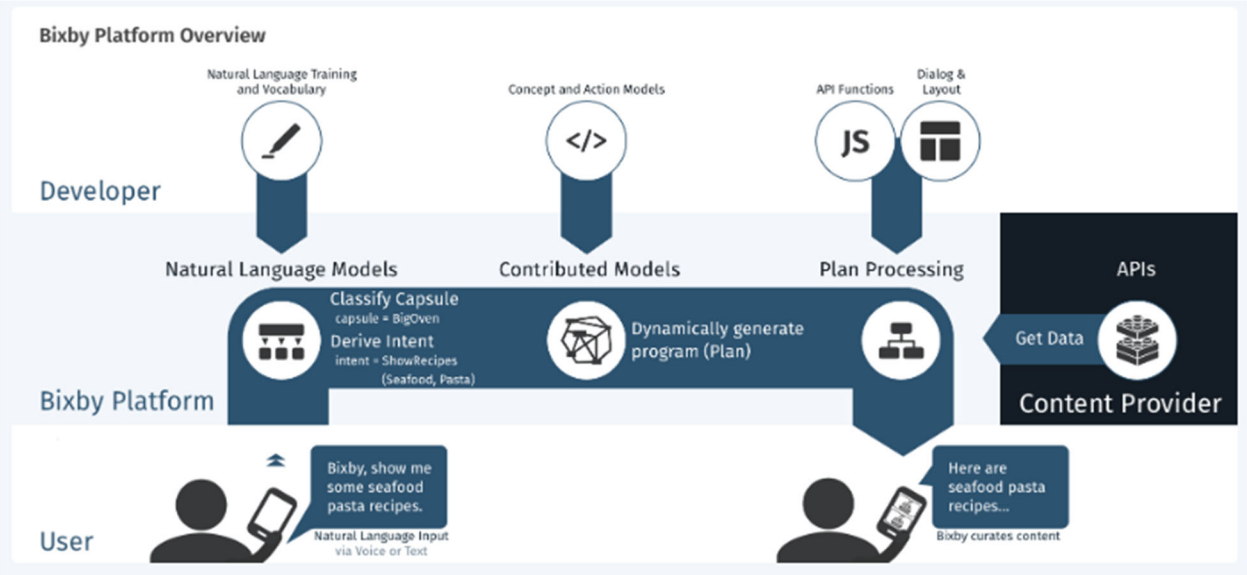
235. Each of '607 Patent Accused Products comprises determining a request based on the merged transcription.

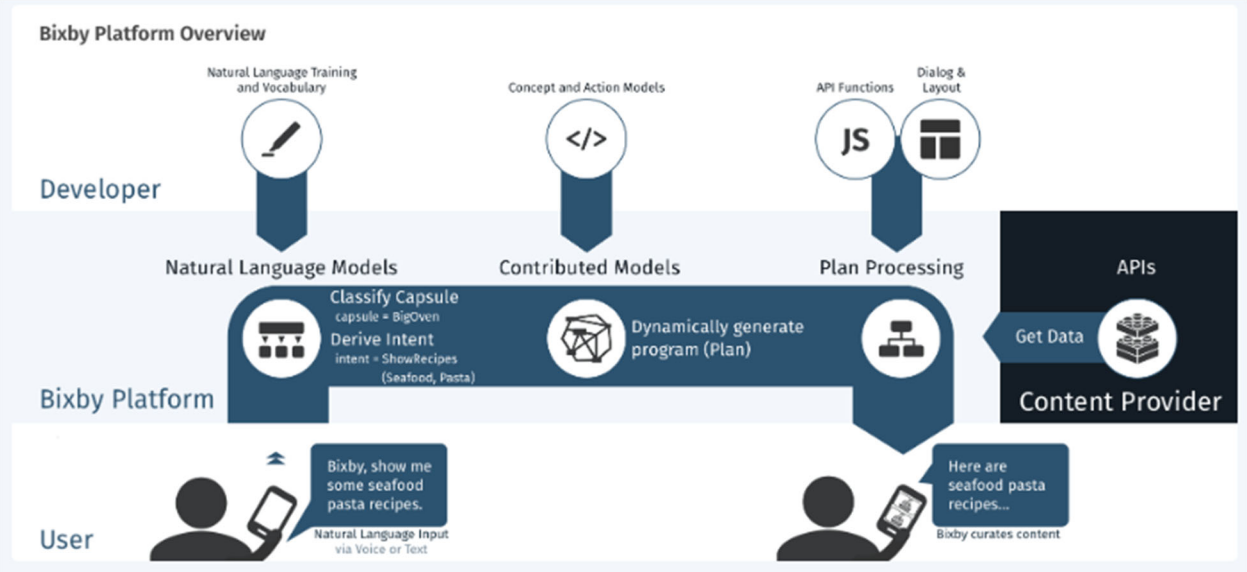
236. For example, the Samsung Bixby platform includes a parser that derives intent and communicates with the capsules.[80]

[79] https://bixbydevelopers.com/dev/docs/dev-guide/developers/customizing-plan.planner-overview
[80] https://bixbydevelopers.com/dev/docs/get-started/overview



237. Each of '607 Patent Accused Products comprises communicating the request to the domain agent, wherein the domain agent is configured to generate a response to the user.

238. For example, the Samsung Bixby platform communicates the derived intent to one of the plurality of capsules that is configured to receive, process and respond to the request.[81]



[81] https://bixbydevelopers.com/dev/docs/get-started/overview

239. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’607 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

240. Users of the ’607 Patent Accused Products directly infringe at least Claim 1 of the ’607 Patent when they use the ’607 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’607 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’607 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’607 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’607 Patent, or, alternatively, was willfully blind to the infringement.

241. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the ’607 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’607 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’607 Patent, or, alternatively, was willfully blind to the infringement.

242. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or

importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’607 Patent, constituting a material part of the invention. Such components may include but are not limited to processors configured to receive a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’607 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

243. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’607 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to processors configured to receive a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input.

244. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the ’607 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and

intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

245. Samsung is not licensed or otherwise authorized to practice the claims of the ’607 Patent.

246. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the ’607 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

247. On information and belief, Samsung has known about the ’607 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the ’607 Patent at least as of the filing of this Complaint. Accordingly, Samsung’s infringement of the ’607 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys’ fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

248. As a result of Samsung’s infringement of the ’607 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung’s infringement, but in no event less than a reasonable royalty with interest and costs.

249. On information and belief, Samsung will continue to infringe the ’607 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’607 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

SEVENTH COUNT
(Infringement of U.S Patent No. 8,849,652)

250. Dialect incorporates by reference the allegations set forth in Paragraphs 1–249 of the Complaint as though fully set forth herein.

251. The claims of the ’652 Patent are valid and enforceable.

252. The claims of the ’652 Patent are directed to patentable subject matter. Particularly, the ’652 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’652 Patent improve on the natural language recognition of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

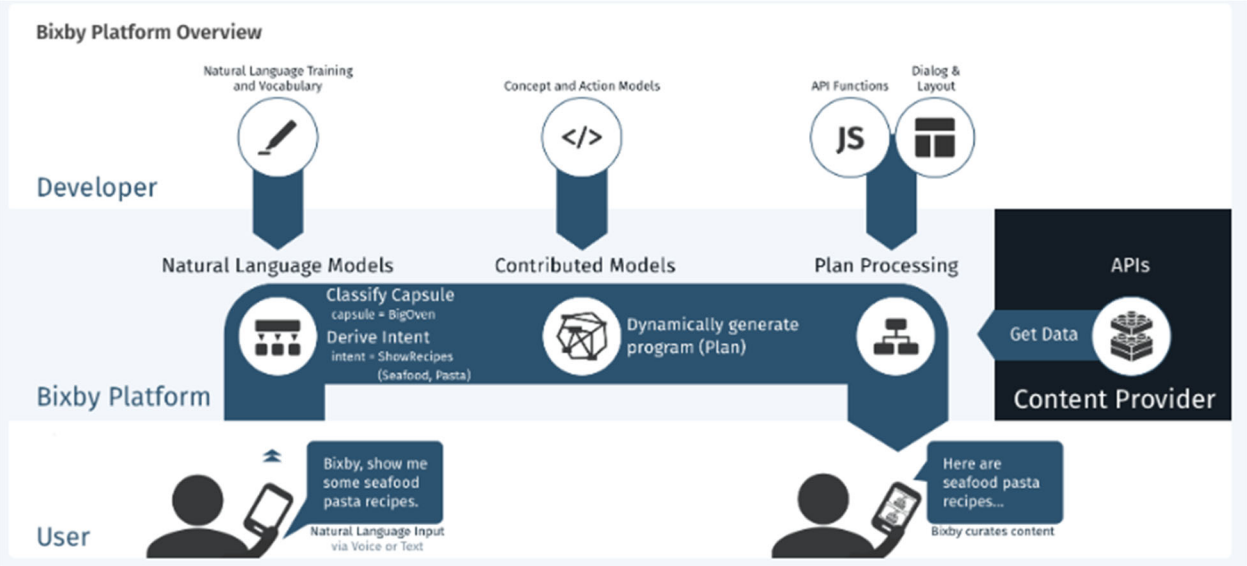
253. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’652 Patent, including at least Claim 1 of the ’652 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’652 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’652 Patent Accused Products”).

254. Each of the ’652 Patent Accused Products comprises 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, as specified and claimed by Claim 1 of the ’652 Patent.

255. Each of the ’652 Patent Accused Products comprises 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.

256. For example, the Samsung Bixby platform uses natural language processing to process natural language requests and determine one or more commands or requests.[82]



[82] https://bixbydevelopers.com/dev/docs/get-started/overview

On the other hand, with Bixby, you simply teach Bixby how to write these programs. With the right modeling and training, you can create a capsule that allows users to say something like this:

"Get me a window seat on a non-stop one-way flight from JFK to San Francisco three days after next Friday"

In just a few milliseconds, Bixby can generate a 40-plus step program to:

- do the math and figure out the date for "three days after next Friday"
- look up candidate airports for San Francisco
- convert between various data types
- and more!

The Samsung Bixby platform is described as processing requests where the recognized words alone are insufficient to completely determine the request, such as when a user requests information on a city name where multiple cities share the same name. [83]

Bixby will at times prompt users when they must make a selection to proceed. For example, if the user says "Weather in San Jose," Bixby must find out which of the many cities in the world the user is interested in. What might seem like the right option for some users (people living in San Jose, CA) can be the completely wrong answer for other users (San Jose, Costa Rica). These are important concerns in a global, dynamic system such as Bixby. Initially, Bixby doesn't know much about the user and how to confidently make a selection in that context. It can then prompt a user more often for clarification. This is an example of a **selection prompt** from a fixed list of values. In this case, once the user selects "San Jose, CA", Bixby learns what types of cities a user might ask about for weather queries. This information is also used anonymously to help new users in the system with similar requests.

Selection Learning is Bixby's way of automatically learning about users from their selections. It helps accelerate and personalize the user's interaction with your capsule by automatically making selections for the user. When a search action returns multiple results and one must be selected from that set (that is, many results are being returned for an input with a `max(one)` cardinality), Selection Learning helps Bixby to disambiguate and select the best options.

257. Each of the '652 Patent Accused Products comprises one or more physical processors programmed with one or more computer program instructions.

258. For example, the Samsung Bixby platform comprises at least the processors in the device on which Bixby is installed and in cloud servers operated by Samsung to process natural language requests from users.

[83] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning

259. Each of the ’652 Patent Accused Products comprises generating a first context stack associated with a first device, the first context stack comprising context information that corresponds to a plurality of prior utterances.

260. For example, the Samsung Bixby platform is described as using training to build on every moment—prior utterances—in a conversation and understanding when to apply context.[84]

> Continuity and Context
>
> Conversations with Bixby are like a choreographed back-and-forth. They build on every moment in a conversation and understanding when to apply context.

The Samsung Bixby platform is further described as including learning algorithms that use a structure including entries for context information corresponding to a plurality of prior requests.[85]

> As the developer, you use Selection Strategies to provide this advice. Note that there are no strategy components related to context (time and location). Bixby's learning algorithms automatically determine which pieces of context are helpful in picking the best option for a user based on their interactions with the system. This includes, among other things, where and when users made requests, where they made selections, and where they completed transactions.

The Samsung Bixby platform is further described as learning how to handle requests by the user based on prior usage patterns across devices registered with Bixby.[86]

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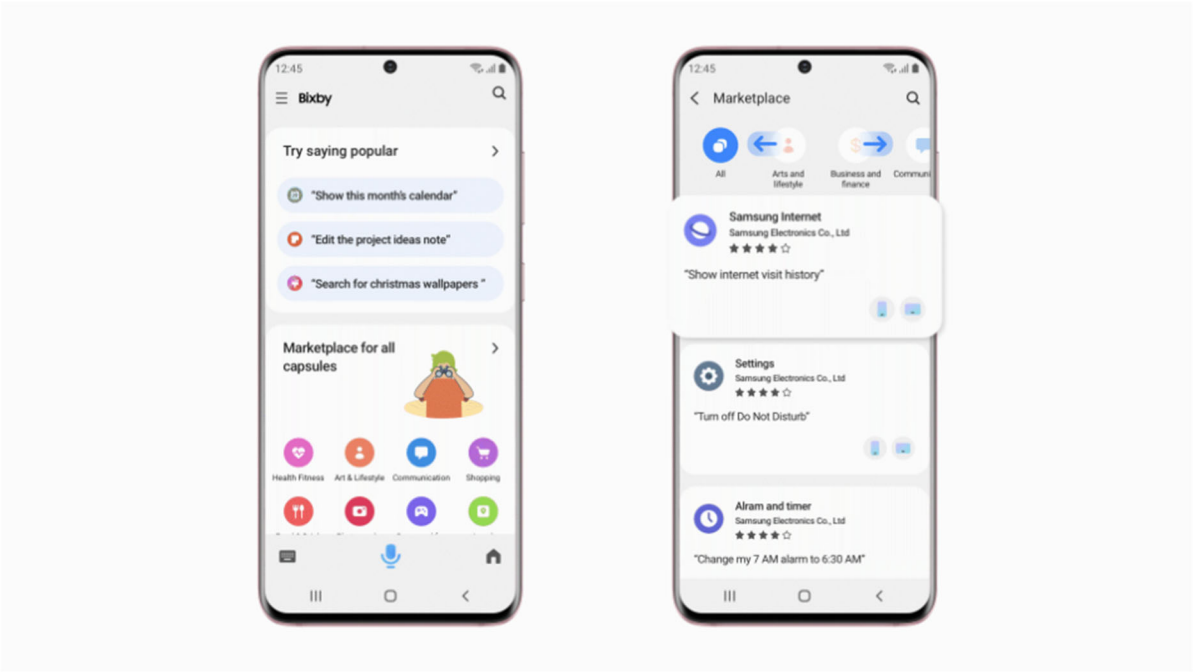
[84] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/design-principles
[85] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning
[86] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

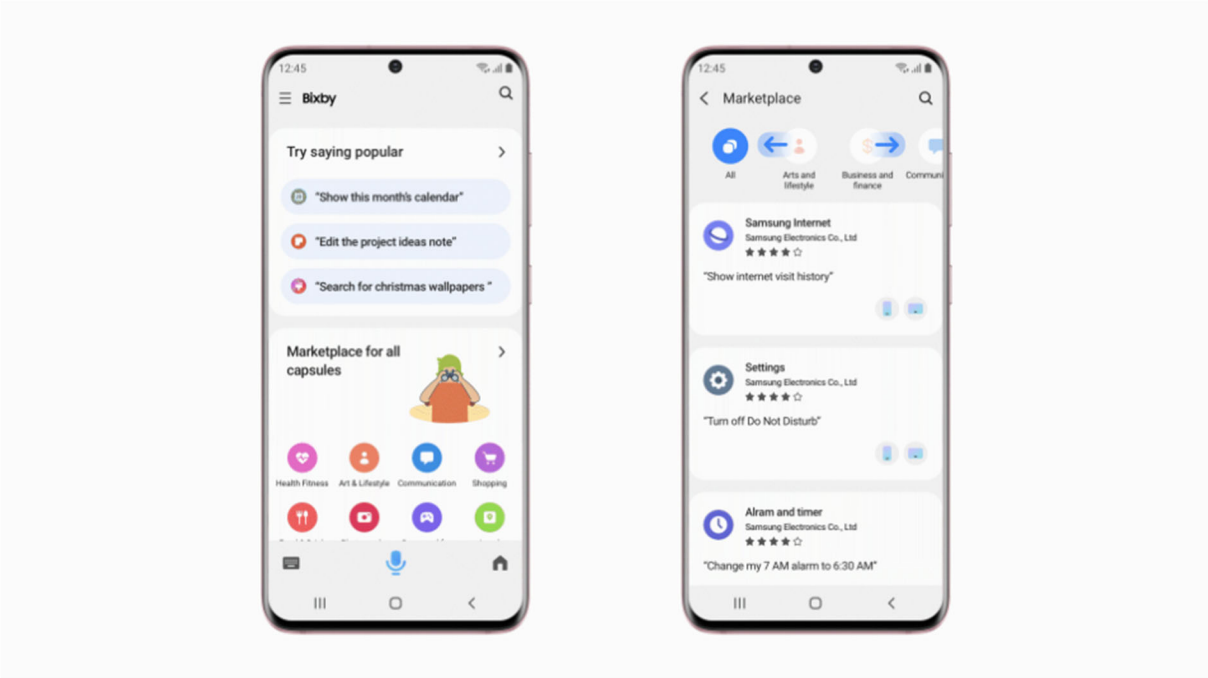
261. Each of the '652 Patent Accused Products comprises synchronizing the first context stack with a second context stack associated with a second device such that the context information of the first context stack is updated based on related context information of the second context stack.

262. For example, Samsung has described the Samsung Bixby platform as communicating across multiple devices that have been registered with Bixby.[87]

[87] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

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Ex. 1043 - Page 115

Samsung further describes using the Samsung Bixby platform to manage and coordinate a plurality of mobile and IoT devices to create multi-device experiences.[88]

Intelligent assistance. Wherever. Whenever.

At the heart of it all is Bixby 2.0 - the intelligent assistant that connects you effortlessly to your Samsung devices, inside and outside of the home. Bixby 2.0 is the central hub of your IoT ecosystem that evolves to understand you better and anticipate your needs.

As part of the multi-device experience, Samsung describes switching music seamlessly between devices, which requires synchronizing data regarding the context of that music between devices.[89]

Samsung Bixby documentation further describes a parameter through which a capsule designer can pass information related to a mobile device to a server through the Samsung Bixby platform.[90]

> You can now use the `$deviceContext` parameter to pass information related to a user device, including the device model, operating system, OS version, and mobile codes. Read more about Passing Device Context Information in the Developers' Guide.

263. Each of the ’652 Patent Accused Products comprises receiving a natural language utterance associated with a command or request.

264. For example, the Samsung Bixby platform uses the natural language from the user as the input and associates the utterance with a command or request.[91]

> Bixby uses natural language (NL) from the user as input. You can improve Bixby's ability to understand NL input by training Bixby to understand real-world examples of natural language in Bixby Developer Studio (Bixby Studio). For example, in the Quick Start Guide, you train the dice game to recognize "roll 2 6-sided dice". This phrase is an **utterance**. NL training is based on utterances that humans might type or say when interacting within Bixby. Utterances don't have to be grammatical and can include slang or colloquial language.

265. Each of the ’652 Patent Accused Products comprises determining one or more words of the natural language utterance by performing speech recognition on the natural language utterance.

266. For example, the Samsung Bixby platform uses natural language training and vocabulary as part of natural language models, which perform speech recognition on the natural language input of the user.[92]

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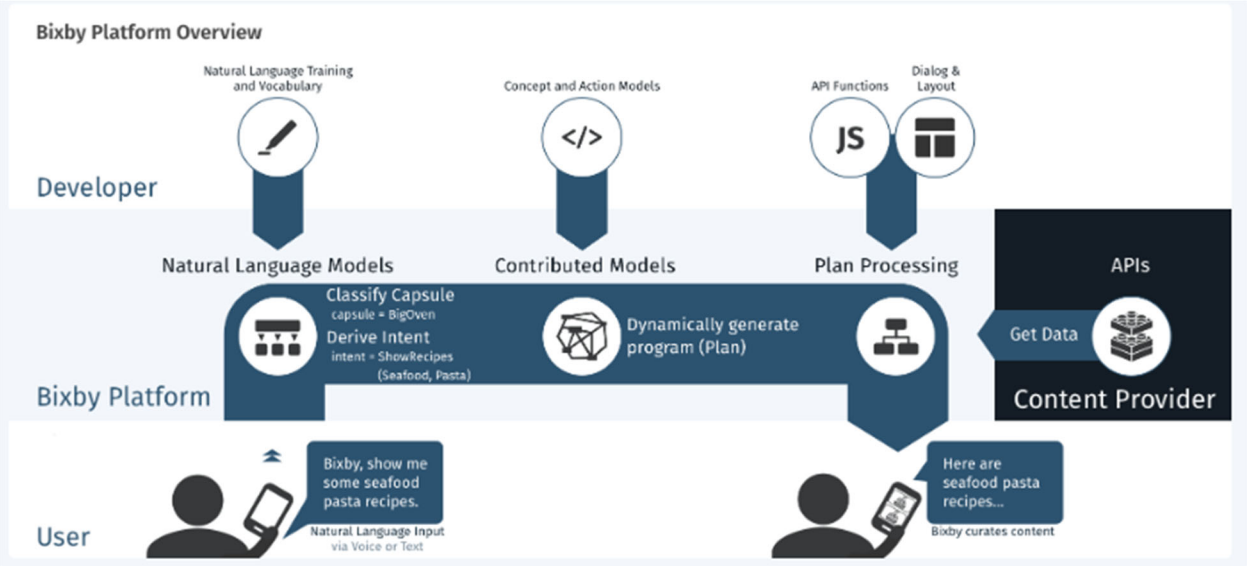
[88] https://www.samsung.com/sg/multi-device-experience/
[89] *Id.*
[90] https://bixbydevelopers.com/dev/docs/dev-guide/release-notes/sdk.2018-Q4-SDK-Release-Notes
[91] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.training-for-nl
[92] https://bixbydevelopers.com/dev/docs/get-started/overview



Vocabulary in the Samsung Bixby platform documentation expressly refers to words or phrases that the natural language models recognize.[93]

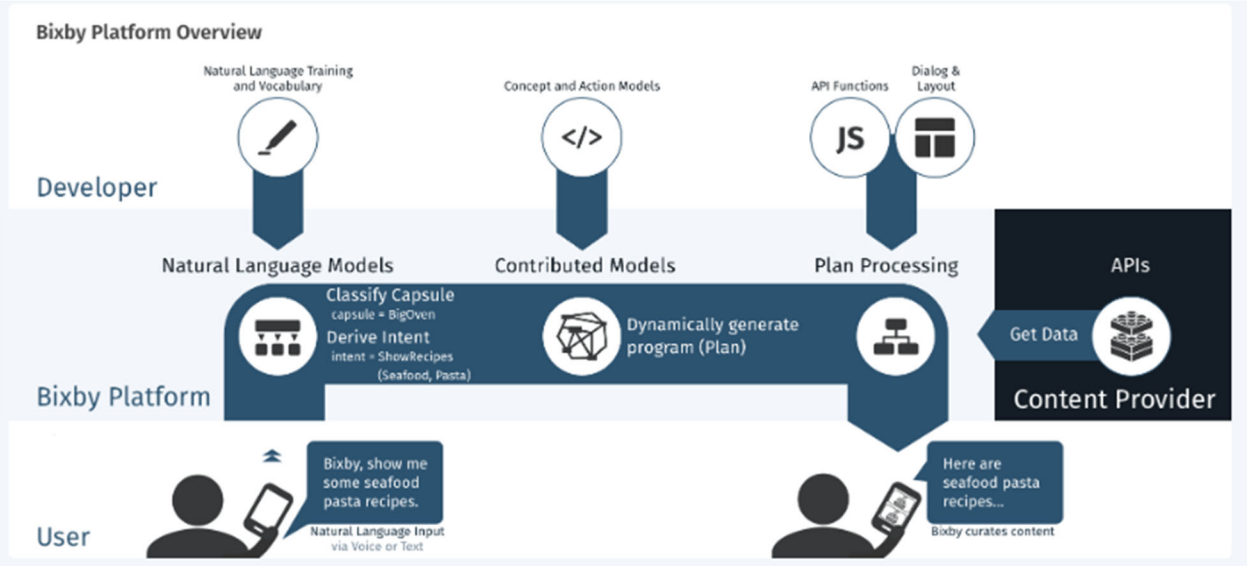
Vocabulary

Words or phrases contributed to a particular node, to allow NL intent interpretation to recognize when that node is referred to. For more information, see Extending Training with Vocabulary.

267. Each of the '652 Patent Accused Products comprises determining the command or request based on the one or more words and the updated context information.

268. For example, the Samsung Bixby platform will generate a plan based on the derived intent to generate a plan associated with a command or request.[94]

[93] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary
[94] https://bixbydevelopers.com/dev/docs/get-started/overview



269. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’652 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

270. Users of the ’652 Patent Accused Products directly infringe at least Claim 1 of the ’652 Patent when they use the ’652 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’652 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’652 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’652 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’652 Patent, or, alternatively, was willfully blind to the infringement.

271. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement,

knowingly inducing customers to commit acts of infringement with respect to the ’652 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’652 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’652 Patent, or, alternatively, was willfully blind to the infringement.

272. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’652 Patent, constituting a material part of the invention. Such components may include but are not limited to one or more physical processors programmed to synchronize context stacks. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’652 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

273. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’652 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to one or more physical processors programmed to synchronize context stacks.

274. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung's infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the '652 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

275. Samsung is not licensed or otherwise authorized to practice the claims of the '652 Patent.

276. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '652 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

277. On information and belief, Samsung has known about the '652 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the '652 Patent at least as of the filing of this Complaint. Accordingly, Samsung's infringement of the '652 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

278. As a result of Samsung's infringement of the '652 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung's infringement, but in no event less than a reasonable royalty with interest and costs.

279. On information and belief, Samsung will continue to infringe the ’652 Patent unless enjoined by this Court. Samsung’s infringement of Dialect’s rights under the ’652 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

EIGHTH COUNT
(Infringement of U.S Patent No. 9,495,957)

280. Dialect incorporates by reference the allegations set forth in Paragraphs 1–279 of the Complaint as though fully set forth herein.

281. The claims of the ’957 Patent are valid and enforceable.

282. The claims of the ’957 Patent are directed to patentable subject matter. Particularly, the ’957 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the ’957 Patent improve on the natural language recognition of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

283. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the ’957 Patent, including at least Claim 1 of the ’957 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products that embody one or more of the inventions claimed in the ’957 Patent, including but not limited to Samsung products including a voice-recognition software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the “’957 Patent Accused Products”).

284. Each of the ’957 Patent Accused Products comprises a system for processing a natural language utterance, the system including one or more processors executing one or more

computer program modules which, when executed, cause the one or more processors to: generate a context stack comprising context information that corresponds to a plurality of prior utterances, wherein the context stack includes a plurality of context entries; receive the natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request; determine one or more words of the natural language utterance by performing speech recognition on the natural language utterance; identify, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries, wherein identifying the one or more context entries comprises: comparing the plurality of context entries to the one or more words; generating, based on the comparison, one or more rank scores for individual context entries of the plurality of context entries; and identifying, based on the one or more rank scores, the one or more context entries from among the plurality of context entries; and determine, based on the determined one or more words and the context information, the command or the request associated with the natural language utterance, as specified and claimed by Claim 1 of the ’957 Patent.

285. Each of the ’957 Patent Accused Products comprises a system for processing a natural language utterance, the system including one or more processors executing one or more computer program modules.

286. For example, the Samsung Bixby platform utilizes at least the one or more processors in the device on which Bixby is installed and in cloud servers operated by Samsung to process natural language requests from users.

287. Each of the ’957 Patent Accused Products comprises generating a context stack comprising context information that corresponds to a plurality of prior utterances, wherein the context stack includes a plurality of context entries.

288. For example, the Samsung Bixby platform is described as using training to build on every moment in a conversation—a prior utterance—and understanding when to apply context.[95]

> Continuity and Context
>
> Conversations with Bixby are like a choreographed back-and-forth. They build on every moment in a conversation and understanding when to apply context.

In another context, the Samsung Bixby platform is further described as including learning algorithms that use a structure including entries for context information corresponding to a plurality of prior requests.[96]

> As the developer, you use Selection Strategies to provide this advice. Note that there are no strategy components related to context (time and location). Bixby's learning algorithms automatically determine which pieces of context are helpful in picking the best option for a user based on their interactions with the system. This includes, among other things, where and when users made requests, where they made selections, and where they completed transactions.

The Samsung Bixby platform is further described as providing customized voice command suggestions based on prior usage patterns across registered devices.[97]

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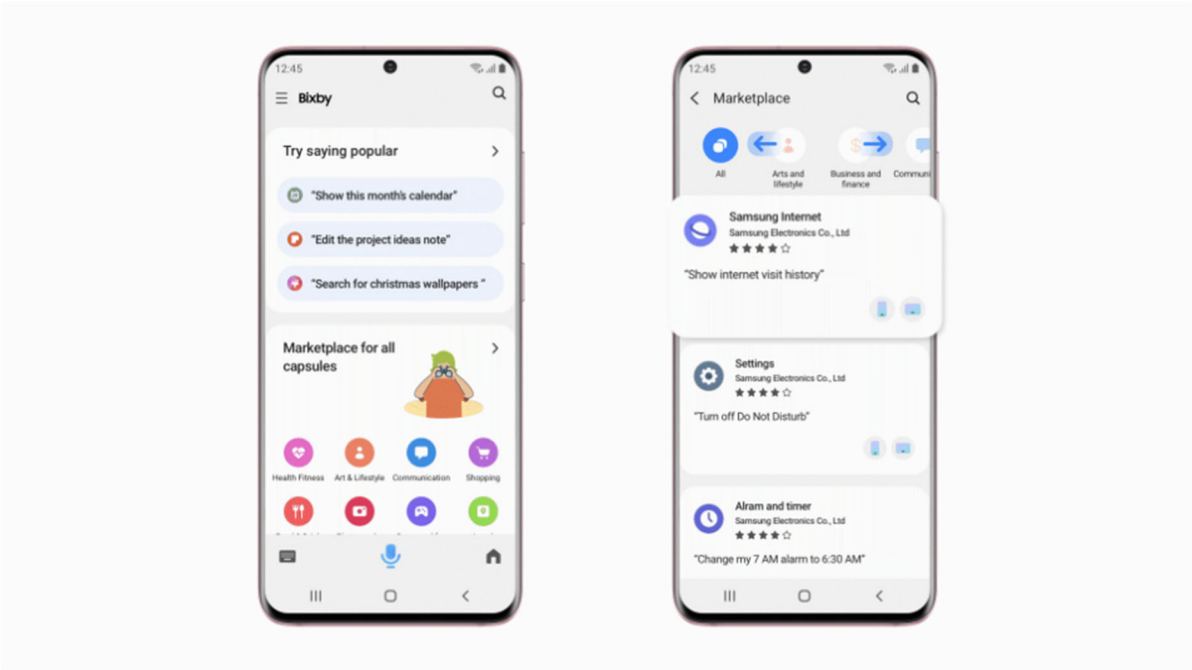
[95] https://bixbydevelopers.com/dev/docs/dev-guide/design-guides/design-principles
[96] https://bixbydevelopers.com/dev/docs/dev-guide/developers/learning.selection-learning
[97] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.



Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

289. Each of the '957 Patent Accused Products comprises receiving the natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request.

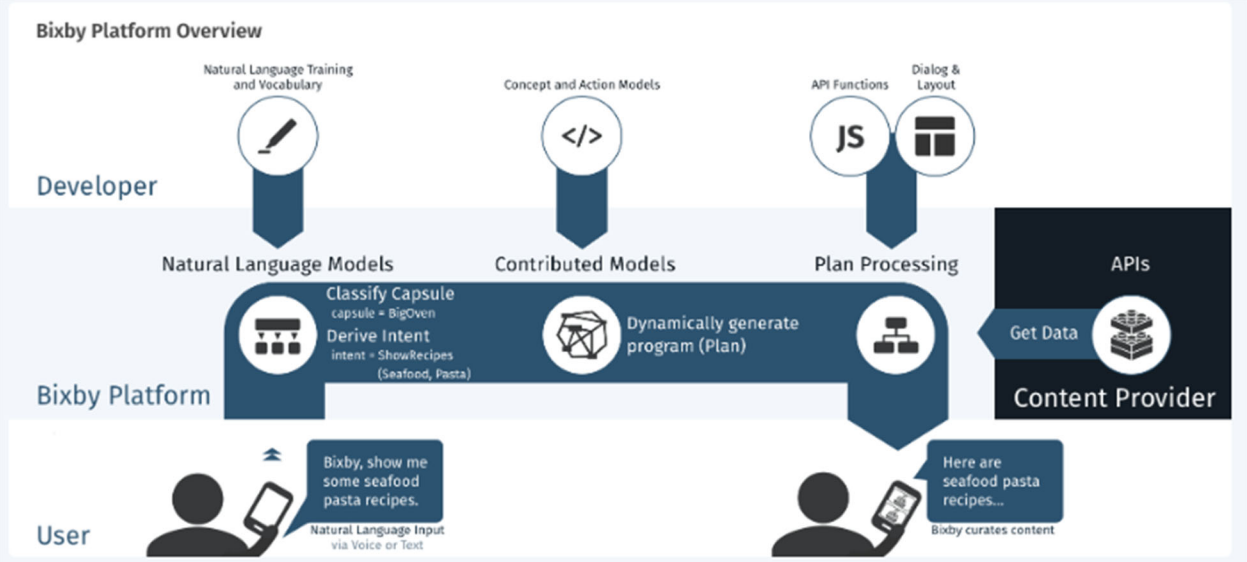
290. For example, the Samsung Bixby platform is described as using the natural language from the user as the input and associates the utterance with a command or request.[98]

[98] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.training-for-nl

Bixby uses natural language (NL) from the user as input. You can improve Bixby's ability to understand NL input by training Bixby to understand real-world examples of natural language in Bixby Developer Studio (Bixby Studio). For example, in the Quick Start Guide, you train the dice game to recognize "roll 2 6-sided dice". This phrase is an **utterance**. NL training is based on utterances that humans might type or say when interacting within Bixby. Utterances don't have to be grammatical and can include slang or colloquial language.

291. Each of the '957 Patent Accused Products comprises determining one or more words of the natural language utterance by performing speech recognition on the natural language utterance.

292. For example, the Samsung Bixby platform is described as using natural language training and vocabulary as part of natural language models, which perform speech recognition on the natural language input of the user.[99]



Vocabulary in the Samsung Bixby platform documentation refers to words or phrases that the natural language models recognize.[100]

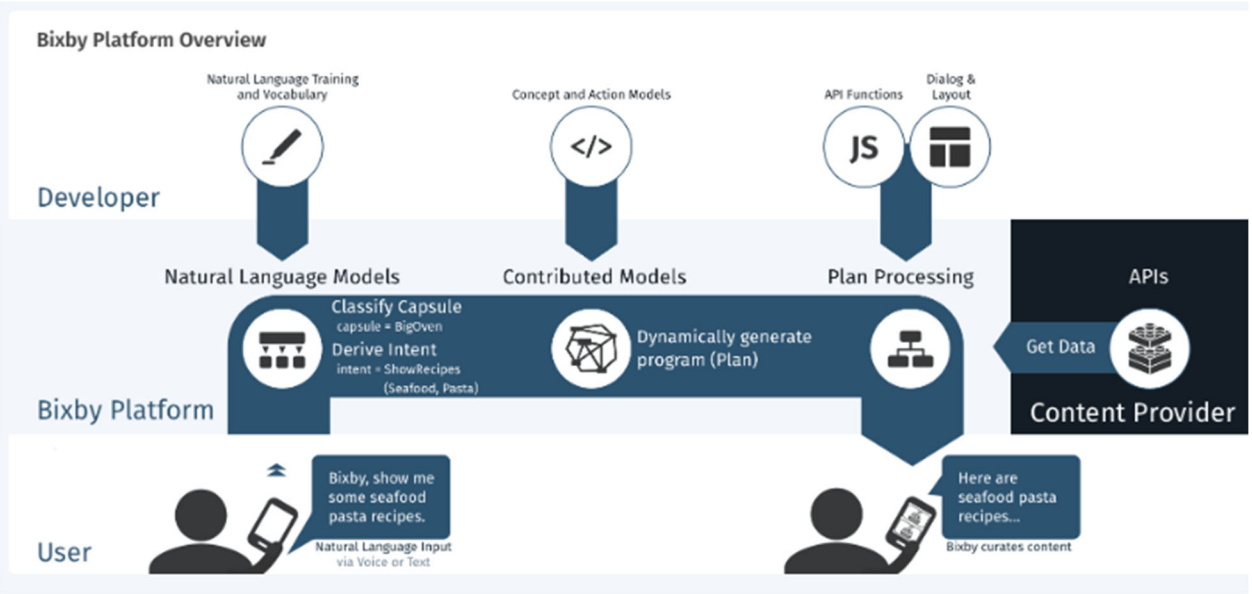
[99] https://bixbydevelopers.com/dev/docs/get-started/overview
[100] https://bixbydevelopers.com/dev/docs/dev-guide/developers/glossary

Vocabulary

Words or phrases contributed to a particular node, to allow NL intent interpretation to recognize when that node is referred to. For more information, see Extending Training with Vocabulary.

293. Each of the '957 Patent Accused Products comprises identifying, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries, wherein identifying the one or more context entries comprises: comparing the plurality of context entries to the one or more words.

294. For example, the Samsung Bixby platform is described as "Classify[ing] Capsules," which requires the platform to determine the appropriate context for the selection of the appropriate capsule.[101]



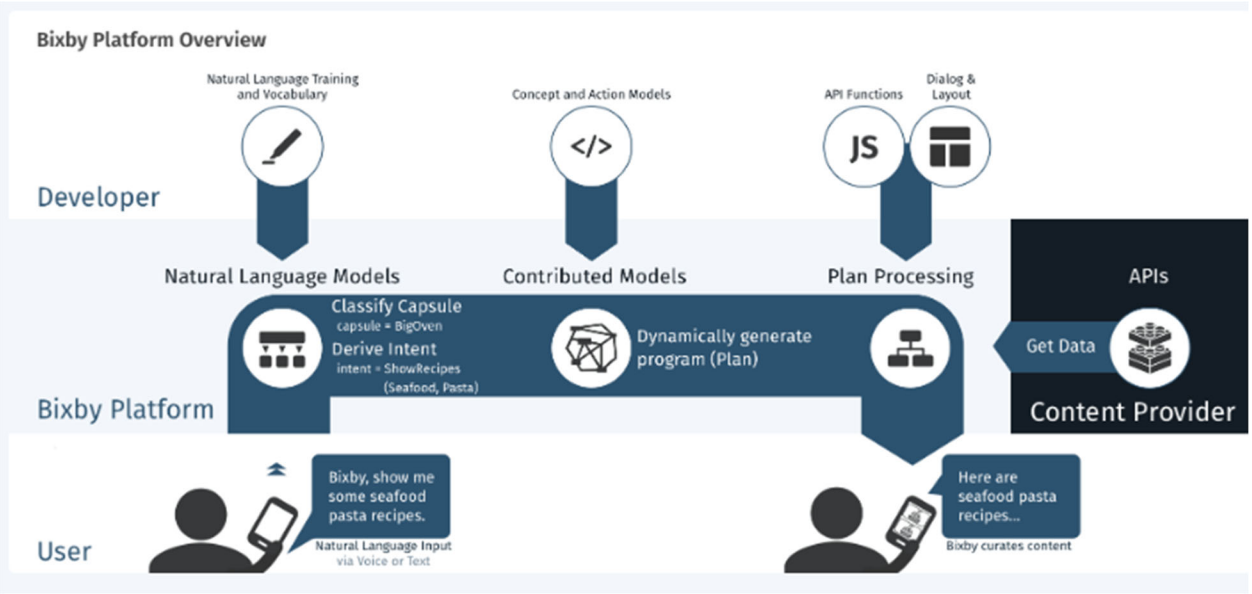
As shown, this is based at least in part by deriving intent from the recognized words corresponding to the context of the request.

[101] https://bixbydevelopers.com/dev/docs/get-started/overview

295. Each of ’957 Patent Accused Products comprises generating, based on the comparison, one or more rank scores for individual context entries of the plurality of context entries.

296. Each of the ’957 Patent Accused Products comprises identifying, based on the one or more rank scores, the one or more context entries from among the plurality of context entries.

297. For example, the Samsung Bixby platform is described as “Classify[ing] Capsules,” which requires the platform to determine the appropriate context for the selection of the appropriate capsule.[102]



Within a capsule, the Samsung Bixby platform is further described as identifying one or more contexts based on a rank score.[103]

[102] https://bixbydevelopers.com/dev/docs/get-started/overview
[103] *Id.*

Let's go back to the example of weather. If the user makes the request, "Weather in Dublin" from San Jose, CA, there are 4 total Dublin localities that Bixby's geo providers know about:

- Dublin, IE
- Dublin, CA
- Dublin, GA
- Dublin, OH

If a user makes an ambiguous query, "Weather in Dublin," which Dublin should Bixby select for the user? Bixby attempts to learn the factors that influence the selection and encode that knowledge in one or more strategies.

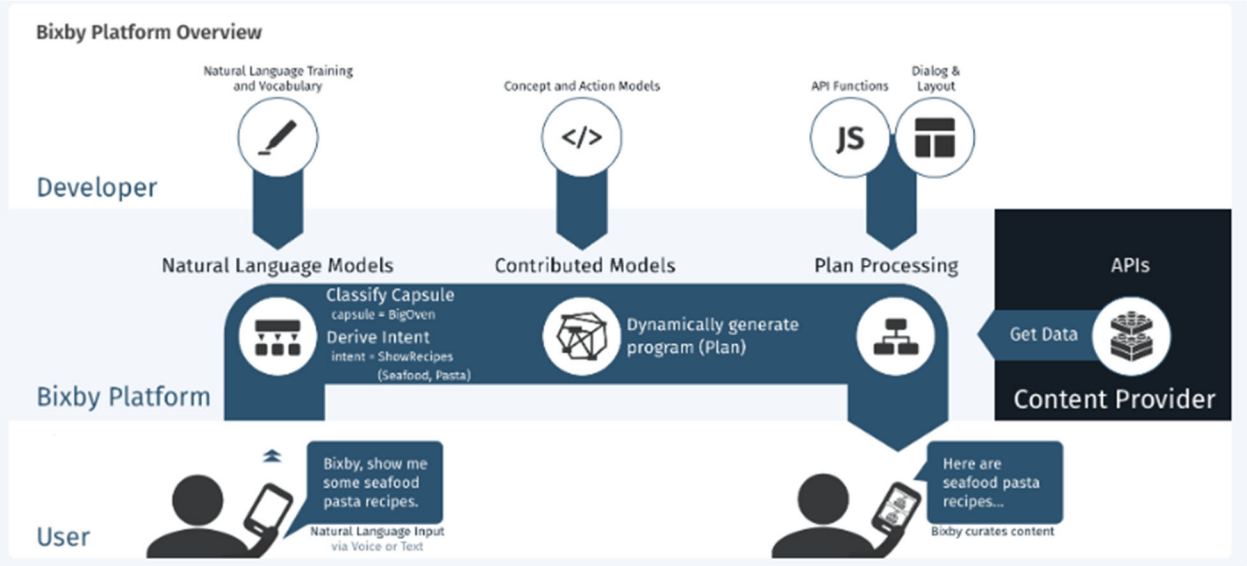
If you don't write a strategy, Bixby uses a default selection, which depends on the order of returned results. If you turn off default decisions, Bixby prompts the user in this case until the developer writes selection strategies to help Bixby learn the best default selection.

Consider if the user is in the same country as one of the options. The `user-in-country` geo strategy below can distinguish the Dublin in Ireland (option 1) from the Dublins in the United States (option 2,3, and 4). With just this strategy, Bixby's learning can learn to pick **Dublin, IE** if that is what the user selects for this request. But Bixby could not select the right Dublin in the United States for the user since there is nothing in the strategy to distinguish between the 3 different US-based Dublins.

298. Each of the ’957 Patent Accused Products comprises determining, based on the determined one or more words and the context information, the command or the request associated with the natural language utterance.

299. For example, the Samsung Bixby platform is described as generating a plan based on the derived intent and processing that plan to generate a command or request.[104]

[104] https://bixbydevelopers.com/dev/docs/get-started/overview



300. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’957 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

301. Users of the ’957 Patent Accused Products directly infringe at least Claim 1 of the ’957 Patent when they use the ’957 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’957 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’957 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’957 Patent Accused Products in the ordinary, customary, and intended way, which Samsung knew infringes at least Claim 1 of the ’957 Patent, or, alternatively, was willfully blind to the infringement.

302. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement,

knowingly inducing customers to commit acts of infringement with respect to the ’957 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’957 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’957 Patent, or, alternatively, was willfully blind to the infringement.

303. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’957 Patent, constituting a material part of the invention. Such components may include but are not limited to one or more physical processors configured to receive a natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’957 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

304. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’957 Patent, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to one or more physical processors configured

to receive a natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request.

305. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung's infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the '957 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

306. Samsung is not licensed or otherwise authorized to practice the claims of the '957 Patent.

307. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '957 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

308. On information and belief, Samsung has known about the '957 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the '957 Patent at least as of the filing of this Complaint. Accordingly, Samsung's infringement of the '957 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

309. As a result of Samsung's infringement of the '957 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung's infringement, but in no event less than a reasonable royalty with interest and costs.

310. On information and belief, Samsung will continue to infringe the '957 Patent unless enjoined by this Court. Samsung's infringement of Dialect's rights under the '957 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

NINTH COUNT
(Infringement of U.S Patent No. 9,734,825)

311. Dialect incorporates by reference the allegations set forth in Paragraphs 1–310 of the Complaint as though fully set forth herein.

312. The claims of the '825 Patent are valid and enforceable.

313. The claims of the '825 Patent are directed to patentable subject matter. Particularly, the '825 Patent is directed to a novel, tangible voice recognition system. The inventive, tangible claimed structures of the '825 Patent improve on the natural language recognition of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech processing in existing systems.

314. On information and belief, in violation of 35 U.S.C. § 271(a), Samsung has directly infringed and continues to directly infringe one or more claims of the '825 Patent, including at least Claim 1 of the '825 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products and processes that embody one or more of the inventions claimed in the '825 Patent, including but not limited to Samsung products including a voice-recognition

software platform, including but not limited to the Samsung Bixby voice-recognition assistant platform (the "'825 Patent Accused Products").

315. Each of the '825 Patent Accused Products comprises a system responsive to a user generated natural language speech utterance, comprising: a plurality of autonomous executable domain agents, each of which is configured to respond to queries and/or commands within a particular domain, wherein the particular domain indicates an area of expertise within which the domain agent is configured to respond to the queries and/or commands; a speech recognition engine configured to recognize one or more words in the user generated natural language speech utterance; a parser configured to: receive from a system agent or an active domain agent of the plurality of autonomous executable domain agents, keyword and associated prior probabilities or fuzzy possibilities; determine, for the natural language speech utterance, a score for each of at least two possible contexts, wherein the scores are determined based on the received keyword and associated prior probabilities or fuzzy possibilities; determine a domain for the user generated natural language utterance based on the recognized one or more words of the natural language utterance and the determined scores for each of the at least two possible contexts; select at least one of the plurality of domain agents based, at least in part, on the determined domain; and provide at least one query and/or command based on the natural language utterance to the selected at least one of the plurality of domain agents, wherein each of the selected at least one of the plurality of domain agents is configured to create one or more queries based on the at least one query and/or command and send the one or more queries in an asynchronous manner to one or more local or external information sources, as specified and claimed by Claim 1 of the '825 Patent.

316. Each of the '825 Patent Accused Products comprises a plurality of autonomous executable domain agents, each of which is configured to respond to queries and/or commands

within a particular domain, wherein the particular domain indicates an area of expertise within which the domain agent is configured to respond to the queries and/or commands.

317. For example, the Samsung Bixby platform utilizes capsules that are configured to respond to queries and/or commands within a particular domain, for example, a ride sharing application[105].

> From the initial request to Bixby's final response, the user's conversation with Bixby is a set of user requests and Bixby's responses. Bixby's responses can include spoken and textual dialog, rendered views (such as a list of hotels in response to a request like "find me a four-star hotel in Union Square in San Francisco"), and prompts. The set of Bixby's responses to a user request is called a **moment** by Bixby. A moment could be the final result to a request, but it could also be Bixby asking the user for more information or clarification, or confirmation of information Bixby's gathered from the user or even assumed based on past interactions. For instance, a ride sharing capsule could learn about the user's typical car choices, and present those choices pre-selected in a confirmation moment. You design these moments using **layouts** and **dialog**.
>
> Together, your models, code, layouts, and dialog form a **capsule**. When you submit a capsule that is approved, it becomes available to all users in the Bixby Marketplace. You can learn how to create and test your first capsule in the Quick Start Guide.

The documentation for Bixby's capsules describes each capsule as corresponding to a domain[106].

> Bixby Developer Studio (Bixby Studio) includes a template system that creates basic code for you that matches your capsule's domain—a search-based capsule, for instance, or a store capsule. This can streamline your development by cutting down on the amount of boilerplate you need to create to get your capsule going.

318. Each of the '825 Patent Accused Products comprises a speech recognition engine configured to recognize one or more words in the user generated natural language speech utterance.

319. For example, the Samsung Bixby platform is described as using natural language from the user as an input and training to recognize one or more words in a user generated natural language speech utterance.[107]

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[105] https://bixbydevelopers.com/dev/docs/get-started/overview
[106] https://bixbydevelopers.com/dev/docs/sample-capsules/templates
[107] https://bixbydevelopers.com/dev/docs/dev-guide/developers/training.training-for-nl

Bixby uses natural language (NL) from the user as input. You can improve Bixby's ability to understand NL input by training Bixby to understand real-world examples of natural language in Bixby Developer Studio (Bixby Studio). For example, in the Quick Start Guide, you train the dice game to recognize "roll 2 6-sided dice". This phrase is an **utterance**. NL training is based on utterances that humans might type or say when interacting within Bixby. Utterances don't have to be grammatical and can include slang or colloquial language.

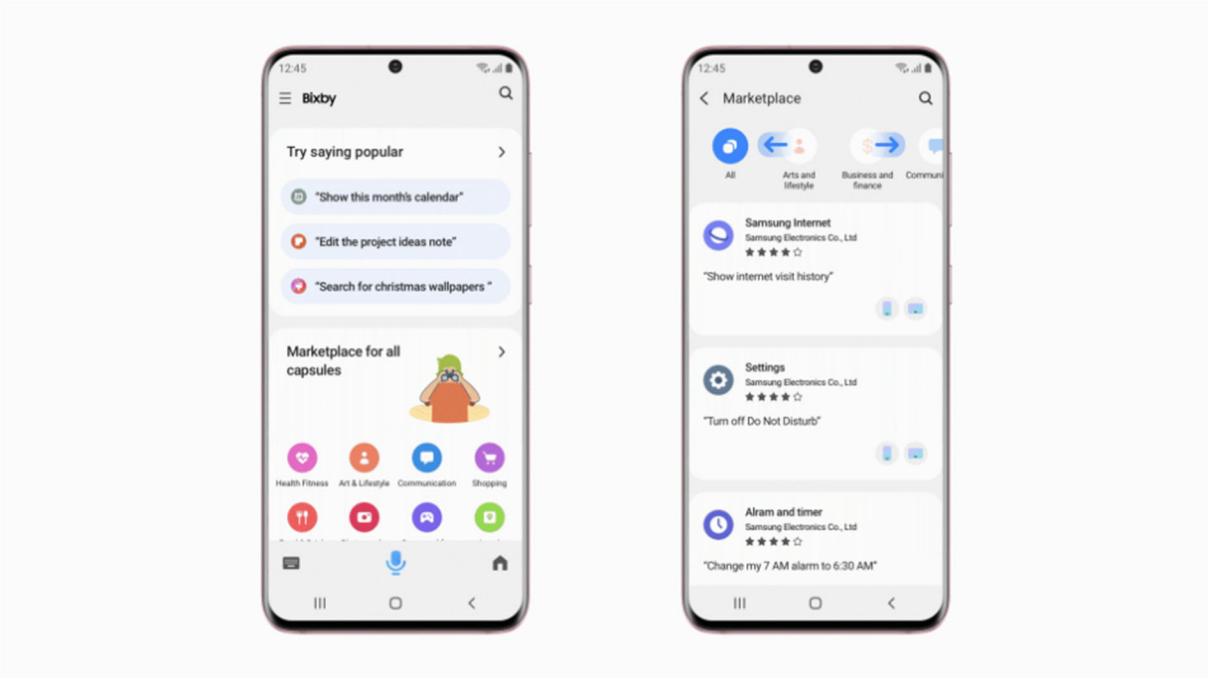
320. Each of the '825 Patent Accused Products comprises a parser configured to: receive from a system agent or an active domain agent of the plurality of autonomous executable domain agents, keyword and associated prior probabilities or fuzzy possibilities.

321. For example, the Samsung Bixby platform includes a parser that receives both the keywords and prior probabilities. Samsung describes the Samsung Bixby platform as using prior usage patterns on the requested device or other devices registered with Bixby.[108]

[108] https://www.samsungmobilepress.com/feature-stories/a-new-bixby-delivers-a-simplified-experience-with-user-requested-features/

Find the Right Command

Using Bixby feels more personal in the latest update, as the service now offers customized voice command suggestions based on your usage patterns and other devices you have registered with Bixby. With recommendations for a variety of apps and services, the new tailored experience helps you discover more ways to use Bixby and improve your Galaxy experience.

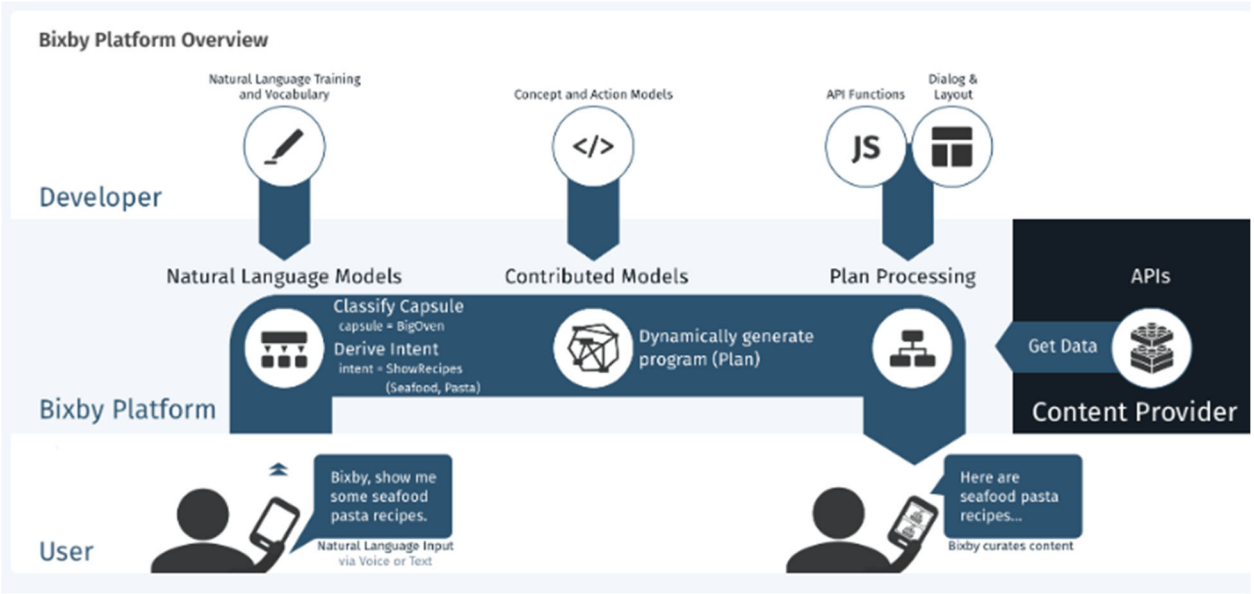


Discovering new ways to use Bixby is also possible by checking the popular voice commands that are trending among other Galaxy users and with hint commands in Bixby Capsules. Tapping Bixby's main screen will also refresh it, offering a new list of recommended commands to sample from.

322. Each of the '825 Patent Accused Products comprises determining, for the natural language speech utterance, a score for each of at least two possible contexts, wherein the scores are determined based on the received keyword and associated prior probabilities or fuzzy possibilities.

323. The Samsung Bixby Platform is described as "Classify[ing] Capsules," which requires the platform to determine the appropriate context for the selection of the appropriate capsule.[109]

[109] https://bixbydevelopers.com/dev/docs/get-started/overview



On information and belief, the Samsung Bixby Platform uses scoring algorithms to score and rank contexts based at least in part on the received keyword and associated prior probabilities as part of the "Classify Capsule" step.

324. Each of the '825 Patent Accused Products comprises determining a domain for the user generated natural language utterance based on the recognized one or more words of the natural language utterance and the determined scores for each of the at least two possible contexts.

325. For example, the Samsung Bixby platform determines the appropriate domain as part of the "Classify[ing] Capsule" step.

326. Each of the '825 Patent Accused Products comprises selecting at least one of the plurality of domain agents based, at least in part, on the determined domain.

For example, the Samsung Bixby platform selects the appropriate capsule based at least in part on the determined domain. Samsung describes the Samsung Bixby platform as identifying relevant capsules and goals based on the scoring algorithm.[110]

> Keep in mind that, when Bixby receives a user request, it attempts to identify a relevant capsule or gives low confidence if no capsules are relevant (such as if the user gives a random or garbage request). Once a capsule is chosen, Bixby then tries to identify the most relevant goal for the utterance. If there is only one goal in your capsule, then that is considered the *best* goal. You are restricted to testing only your capsule, so strive to ensure your capsule addresses all of the utterances for your use cases. While testing, you should not have to worry about extraneous utterances matching your capsule as those will not be the case with your users.

327. Each of the '825 Patent Accused Products comprises providing at least one query and/or command based on the natural language utterance to the selected at least one of the plurality of domain agents, wherein each of the selected at least one of the plurality of domain agents is configured to create one or more queries based on the at least one query and/or command and send the one or more queries in an asynchronous manner to one or more local or external information sources.

328. For example, the Samsung Bixby platform provides one or more queries or commands in an asynchronous manner to one or more local or external information sources.[111]

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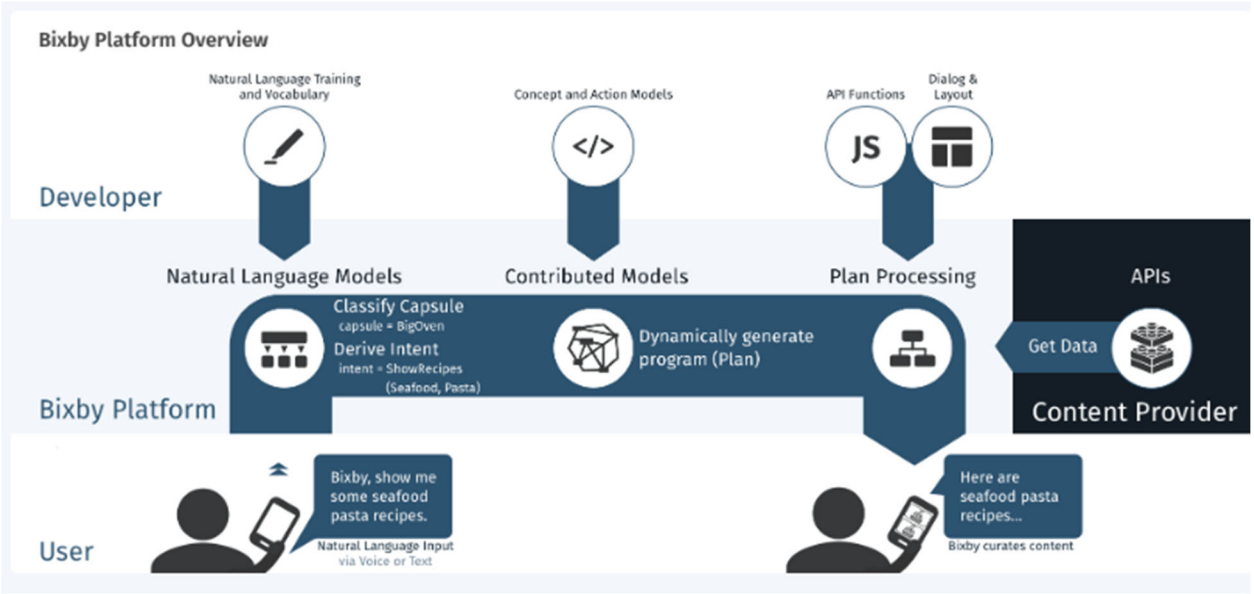
[110] *Id.*
[111] https://bixbydevelopers.com/dev/docs/get-started/overview



The Samsung Bixby Platform is further described as using the Fetch action as one method to asynchronously request data.[112]

Sometimes, properties can be too time-intensive or resource-expensive to be populated each time that a `structure` concept is called during a `Search` action. **Lazy properties** allow you to call these properties only when necessary by using the `lazy-source` key. For a given property that you don't want populated each time, you would associate the lazy property with a `Fetch` action, which is called asynchronously with that data on demand. Bixby would call this `Fetch` action, for example, in `Details` layouts or specific dialogs for structures.

```
property (%name%) {
  type (%type%)
  lazy-source (%lazy-action%)
}
```

The Samsung Bixby Platform is further described as communicating with external web services to perform actions that can't be completed on the device through at least HTTP API calls.[113]

[112] https://bixbydevelopers.com/dev/docs/dev-guide/developers/modeling.modeling-concepts.lazy-properties
[113] https://bixbydevelopers.com/dev/docs/sample-capsules/samples/http

HTTP API Calls

It's common for Bixby capsules to communicate with an external web service to perform actions that can't be completed on the device: fetching the weather report for a given location, getting a list of nearby Italian restaurants, booking a hotel room, and so on. To use web APIs, your JavaScript action implementation (endpoints) can take advantage of Bixby's HTTP library, and can even call them directly as remote endpoints. This small sample capsule, an adaptation of the larger "Shoe Store" simple search sample capsule, demonstrates both the HTTP library and remote endpoints.

Download Capsule

Note

Because you cannot submit a capsule with the `example` namespace, in order to test a sample capsule on a device, you must change the `id` in the `capsule.bxb` file from `example` to your organization's namespace before making a private submission.

For example, if your namespace is `acme`, change `example.http` to `acme.http`.

Since this capsule demonstrates an HTTP API, it requires an API server to communicate with. The capsule is set up to use a simple Node.js-based server that we have set up for you at AppSpot, so you don't need to run the demonstration server yourself.

329. Further, on information and belief, Samsung has actively induced and/or contributed to infringement of at least Claim 1 of the ’825 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

330. Users of the ’825 Patent Accused Products directly infringe at least Claim 1 of the ’825 Patent when they use the ’825 Patent Accused Products in the ordinary, customary, and intended way. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the ’825 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the ’825 Patent Accused Products to consumers within the United States and instructing and encouraging such customers to use the ’825 Patent Accused Products in the ordinary, customary, and intended way,

which Samsung knew infringes at least Claim 1 of the ’825 Patent, or, alternatively, was willfully blind to the infringement.

331. On information and belief, Samsung’s inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the ’825 Patent Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the ’825 Patent Accused Products in the United States, which Samsung knew infringes at least Claim 1 of the ’825 Patent, or, alternatively, was willfully blind to the infringement.

332. On information and belief, in violation of 35 U.S.C. § 271(c), Samsung’s contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 1 of the ’825 Patent, constituting a material part of the invention. Such components may include but are not limited to a speech recognition engine configured to recognize one or more words in the user generated natural language speech utterance. On information and belief, Samsung knows and has known the same to be especially made or especially adapted for use in an infringement of the ’825 Patent, and such components are not a staple article or commodity of commerce suitable for substantial noninfringing use.

333. On information and belief, in violation of 35 U.S.C. § 271(f)(1), Samsung’s infringement further includes without authority supplying or causing to be supplied in or from the United States all or a substantial portion of the components of the patented invention of at least Claim 1 of the ’825 Patent, where such components are uncombined in whole or in part, in such

manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States. Such components may include but are not limited to a speech recognition engine configured to recognize one or more words in the user generated natural language speech utterance.

334. On information and belief, in violation of 35 U.S.C. § 271(f)(2), Samsung's infringement further includes without authority supplying or causing to be supplied in or from the United States components of the patented invention of at least Claim 1 of the '825 Patent that are especially made or especially adapted for use in the invention and not staple articles or commodities of commerce suitable for substantial noninfringing use, where such components are uncombined in whole or in part, knowing that such components are so made or adapted and intending that such components will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States.

335. Samsung is not licensed or otherwise authorized to practice the claims of the '825 Patent.

336. Thus, by its acts, Samsung has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '825 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 1.

337. On information and belief, Samsung has known about the '825 Patent based on its attempts to purchase the Asserted Patents on or about 2013. At a minimum, Samsung has knowledge of the '825 Patent at least as of the filing of this Complaint. Accordingly, Samsung's infringement of the '825 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

338. As a result of Samsung's infringement of the '825 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Samsung's infringement, but in no event less than a reasonable royalty with interest and costs.

339. On information and belief, Samsung will continue to infringe the '825 Patent unless enjoined by this Court. Samsung's infringement of Dialect's rights under the '825 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for judgment and seeks relief from Samsung as follows:

a. For judgment that Samsung has infringed and continues to infringe the claims of the '209, '738, '367, '327, '468, '607, '652, '957, and '825 Patents;

b. For a permanent injunction against Samsung and its respective officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all other acting in active concert therewith from infringement of the '209, '738, '367, '327, '468, '607, '652, '957, and '825 Patents;

c. For an accounting of all damages sustained by Plaintiff as a result of Samsung's acts of infringement;

d. For a mandatory future royalty payable on each and every future sale by Samsung of a product that is found to infringe one or more of the Asserted Patents and on all future products which are not colorably different from products found to infringe;

e. For a judgment and order finding that Samsung's infringement is willful and/or egregious and awarding to Plaintiff enhanced damages pursuant to 35 U.S.C. § 284;

f. For a judgment and order requiring Samsung to pay Plaintiff's damages, costs, expenses, and pre- and post-judgment interest for its infringement of the '209, '738, '367, '327, '468, '607, '652, '957, and '825 Patents as provided under 35 U.S.C. § 284;

g. For a judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees; and

h. For such other and further relief in law and in equity as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff demands a trial by jury in this action for all issues triable by a jury.

Dated: February 17, 2023

Respectfully Submitted,
/s/ Garland Stephens by permission Charles Everingham IV

Garland Stephens
Texas Bar No. 24053910
garland@bluepeak.law
BLUE PEAK LAW GROUP LLP
3139 W. Holcombe Blvd, PMB 8160
Houston, Texas 77025
Telephone: 281-972-3036
Fax: 281-972-3036

Richard Koehl
Texas Bar No. 24115754
richard@bluepeak.law
BLUE PEAK LAW GROUP LLP
PO Box 20204
New York, NY 10001-0006
Telephone: (917) 856-3872

Robert Magee
California Bar No. 271443
robert@bluepeak.law
Jeff Risher
California Bar No. 204089
jeff@bluepeak.law
BLUE PEAK LAW GROUP LLP
Telephone: 281-972-3036
3790 El Camino Real, PMB 846
Palo Alto, California 94306
Telephone: (281) 972-3036

Chad Everingham
Texas State Bar No. 00787447
ce@wsfirm.com
Claire Abernathy Henry
Texas State Bar No. 24053063
claire@wsfirm.com
Andrea Fair
Texas State Bar No. 24078488
andrea@wsfirm.com
WARD, SMITH & HILL, PLLC
PO Box 1231
Longview, Texas 75606
Telephone: (903) 757-6400
Facsimile: (903) 757-2323

ATTORNEYS FOR PLAINTIFF
DIALECT, LLC