Business Voice Calling
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1 Introduction

1.1 Overview

This document introduces business voice calling and discusses prospects and opportunities to augment it with other real-time services such as video, Augmented Reality (AR) and interactive calling. Section 2 explores different use cases, section 3 introduces different business models, and section 4 describes an ecosystem for developing and deploying business voice calling services. Section 5 describes an architecture for business voice calling based on IP Multimedia Subsystem (IMS). The document concludes with a summary of dependencies and with some recommendations.

1.1.1 What is business voice calling?

Business voice calling is a telephony service for business purposes. At least one communication party is a business and at least one party is an end-user or consumer.

For end-users, business voice calling is often an experience where a subscriber receives a call from an unknown phone number (or even from a hidden one) and only finds out who is calling them and why after answering the call. It is a domain where fraud towards subscribers and robocalls are major annoyances. When calling a business, the subscriber needs to look up a business phone number through some internet service, dial that number and often navigate their way through a menu structure before ending up in a queue waiting for an agent.

Businesses want to display trusted identities to their customers to increase the answering rate, and they want to provide richer interactive capabilities to improve service efficiency.

Revenue from business voice calling is an important part of the income received from telecommunications services. In recent years the total revenue from voice services of some CSPs has been declining, while that from the enterprise market continues to rise.

With business messaging as defined in Rich Communication Suite (RCS) significantly improving a branded experience, Communication Service Providers (CSPs) and global players are now turning their attention to the new opportunities that exist in business voice calling.

1.1.2 Prospects and opportunities for business voice calling

Business to Consumer (B2C) communication is becoming very important, both for businesses to communicate to their customers and vice versa. Some businesses have started using web-based communication to provide an enhanced experience to their customers, but that communication is not integrated into consumers' normal communication devices like smartphones. Operators have been key to providing B2C communication by providing break-in and break-out of the calls and also providing services such as toll-free service, premium calling services, but that is limited to only normal voice communication.

With business voice calling, operators can provide differentiated communication services to business customers by enabling business voice services for consumers. This will help operators to be part of the overall value chain and even to provide enhanced services to their business and consumer customers.

For businesses, it will be a win-win situation to use their B2C applications and provide their customers with an integrated communication experience provided through business voice services.

Business voice service will enable new and innovative use cases that will provide overall value to communication and thus value to the ecosystem partners.

1.2   Scope

The scope of this document is to provide a common understanding of the Business Voice service among the entities involved in delivering this service. The document, at a high level, touches the Business Voice use cases, the business model with the value chain, the ecosystem and relevant partners and a high level proposed architecture and dependencies. Business Voice focuses on voice but includes augmentation of the call with other real-time services such as video, AR and interactive calling.

This document can be taken as a reference document to align with different GSMA workstreams/workgroups to have a more detailed analysis of different aspects, especially the architecture and dependencies on existing and new services.

1.3 Definition of Terms & Abbreviations

Term	Description
AR	Augmented Reality
B2C	Business to Consumer
C2B	Consumer to Business
CLIP	Calling Line Identification Presentation
CSP	Communication Service Provider
HPMN	Home Private Mobile Network
IMS	IP Multimedia Subsystem
MNO	Mobile Network Operator
NNI	Network-to-Network Interface
OS	Operating System
PBX	Private Branch eXchange
RCS	Rich Communication Suite/Services
RTCP	Real Time Control Protocol
RTP	Real Time Protocol
SLA	Service Level Agreement
UE	User Equipment
UNI	User-to-Network Interface
VoLTE	Voice over LTE
VoNR	Voice over New Radio
VPMN	Visited Private Mobile Network
vPBX	virtual PBX
VR	Virtual Reality

1.4 References

Ref	Document Number	Title
1	GSMA PRD IR.65	IMS Roaming, Interconnection and Interworking Guidelines
2	GSMA PRD IR.92	IMS Profile for Voice and SMS
3	GSMA PRD IR.94	IMS Profile for Conversational Video Service
4	GSMA PRD NG.114	IMS Profile for Voice, Video and Messaging over 5GS
5	GSMA PRD NG.129	IMS Data Channel

2 Use cases

2.1 Overview

The following use cases illustrate some of the pre-call, in-call, post-call and multi-party call services enriching a voice or video call which may be from or to a business. These services

extend business service capability to improve consumers' experience, enhance communication efficiency and may provide more business services during the call.

2.2 Business Multimedia Calling Line Identification Presentation (CLIP) and Anti-Fraud Protection

The business multimedia CLIP service provides consumers with the purpose of the call to increase the call pick-up rate. The service can also provide an introduction to the business or to products to attract consumers.

In this use case, a business enhances the CLIP service with additional multimedia elements, such as verified identity, calling subject, calling importance, location, picture/video, interactive buttons, etc. After the calling business initiates a call, the called device can receive a series of elements set by the calling business and display them on the screen.

Numerous calls received on a user's device originate from businesses. Often those calls are from unrecognized numbers, as they are not part of the user's device address book. A significant percentage of those calls are rejected. Usually considered spam, some businesses suffer from this low pick-up rate even when the call was targeted to this customer (e.g. home delivery, healthcare, banking or even retailer follow-up). Marketing studies show that providing identification of unrecognized numbers increases the pick-up rate.

The steps are as follows:

1. Before the call is made, a business can be verified by the CSP and set up business CLIP service information with the CSP, including various information, e.g. verified mark, business image/logo, business name, business number. Multimedia information such as a customised business video and interactive buttons may also be part of the verified CLIP information.
2. The agent of the business may select call-context information such as call subject, business location, customized business video, website link and interactive buttons before making a call. If verified CLIP is available, the verified CLIP shall always be sent to the user.
3. The business calls a consumer for service recommendations.
4. The terminating CSP checks if the calling business is verified

   a) If the business is verified, the customer's mobile phone rings with the verified business CLIP information and selected call-context information.
   b) If the business is not verified, the verification mark cannot be sent to the user, and a call qualification by the CSP (e.g. spam, telemarketing, acceptable) may be shown to the user when the customer's mobile phone rings. Other CLIP information and call-context information may be provided depending on CSP policy.
   c) Even if a business is verified, when the customer's mobile phone rings, a call qualification by the CSP may be shown to the user along with the verified business CLIP information and selected call-context information.

5. The user's device displays the incoming call including CLIP service information and call-context information as shown in Figure 1.

Figure 1: Example of business multimedia CLIP

2.3   Interactive calling

Interactive calling means that during the call with a business, a consumer will be able to interact with the business in other ways than just voice/video, for example, screen sharing and marking, picture/video/file sharing, browsing the web page, AR, or Virtual Reality (VR) could each be used during the call.

Interactive calling will help businesses improve the voice calling service experience, enhance communication efficiency and create a lot of new opportunities to sell more and cut costs. Imagine that every time someone calls a business, they can be presented with visual interactive menus which they can click, type in, or browse, to name a few examples. Anything you have seen on the internet or smartphone apps can be part of a voice call in 5G.

> NOTE: A potential way to realize this and other use cases using the IMS data channel is described in the NG.129 IMS Data Channel white paper [5].

Example 1: Visual interactive menu

Figure 2: Example of a visual interactive menu

In the use case shown in Figure 2, a business enhances an incoming call from a consumer with a visual interactive menu on the call screen, providing navigation prompts to guide customers to the desired service. The steps are as follows:

1. The user calls a bank service centre for support.
2. The bank service centre provides a visual interactive menu to the user.
3. The user selects option 2 and then receives a new visual interactive menu provided by the service centre according to their selection. The user makes selections from the interactive menus step by step until connected to the desired service agent.
4. The service centre agent may also provide web pages related to the user's interested service.

Example 2: Content/screen sharing

In this use case, a business enhances its customer service to increase customer satisfaction and loyalty. When a customer calls the business for help, the agent of the business uses content/screen sharing to help resolve the customer's issues. The steps are as follows:

1. User A wants to do some operations on their bank account using the bank's self-service system and then faces a problem and doesn't know how to proceed. User A calls the bank's customer service centre for help.
2. The call is picked up and a bank customer service centre agent takes charge of this call.
3. A video is played by the bank agent to user A, which includes step-by-step instructions. However user A still does not fully understand what to do.
4. The agent sends a request to ask user A to share their screen to better understand the situation and question.
5. A pop-up requesting screen sharing consent is displayed on user A's screen.
6. User A clicks the "yes" button and screen sharing starts.
7. While viewing user A's screen, the agent suggests to the user what they should do next.

8. After the question is resolved, user A stops the screen sharing and may continue the call with the agent for more customer service questions or may disconnect the call at once.

Example 3: Interactive business ring back media

In this use case, a business customizes some ring back media, such as promotional/marketing videos, to be shown to customers when a customer calls the business. While the video is playing to the calling customer, some interactive buttons are also displayed. If the customer is interested in the business, the customer may use these buttons to navigate the business website, become a member, etc. The steps are as follows:

1. A customer uses a smartphone to call a business.
2. During the ringing stage, a customized video of the business is played to the customer.
3. While the video is playing, a menu of interactive actions represented by some icons or buttons is displayed as an overlay on top of the video content, enabling the customer to select an action.
4. The user preference is expressed by the menu selection, for instance, the customer can select to become a member of the business or to navigate the business website.

2.4   AR calling

Using AR in business calls will help the business to enrich the user experience with AR and the business service will be more helpful for users.

Taking AR remote cooperation as an example, the steps are as follows:

1. User A has some difficulty in repairing a machine and makes a video call with AR glasses to User B which is a technical supporter of a business.
2. After User B answers the call by a mobile phone, user A looks at the machine with his AR glasses and tells user B what the problem is. What user A sees, hears, says are sent to user B in real-time.
3. User B sees a real-time video that shows what user A sees and hears what user A hears and says.
4. User B overlays some AR marks (like 3D circles, arrows, etc.) on the received video to help user A find the right place/button on the machine, and tells user A what to do.
5. With AR glasses, user A sees some virtual marks overlaying on the machine, and hears user B's guidance. Thus user A can follow user B's instructions step by step to check or repair the machine.

2.5   Integrated with business messaging

When both business messaging and voice calling are used for communication between a business and a user, it should be clear to the user that the voice call and the business messaging are from the same verified business.

2.5.1   User starts communication via business messaging and then moves to a voice call

This use case shows integration between business voice calling and business messaging where a user starts communication via business messaging and then moves to a voice call:

1. A user starts a chatbot session from the messaging UI and asks a series of questions about after-sales service.
2. However, the chatbot can't solve the issue and therefore suggests that the user make a voice/video call.
3. Once the user presses the "Call us for further assistance" button in the RCS chatbot session, a voice/video call with the call centre is set up.
4. After being connected, the call centre agent knows the new call is triggered from an RCS chatbot session and correlates the call with the information from the earlier chatbot session so the user doesn't need to start from zero.

2.5.2 User starts communication via a voice call and then moves to business messaging

This use case shows integration between business voice calling and business messaging where a user starts communication via a voice call and then moves to business messaging after the call is over:

1. A user starts a voice call from the dialler in the User Equipment (UE) to a business and speaks with an agent about scheduling a home repair service visit.
2. The agent proposes some dates and times for the visit and agrees on one with the user.
3. When a time has been agreed, then after the call, the agent sends an RCS business message with the service time to the user so that it is kept in the user's local chatbot log.

2.5.3 User starts communication via a voice call and then uses business messaging during the call

This use case shows integration between business voice calling and business messaging where a user starts communication via a voice call and then uses business messaging during the call:

1. A user starts a voice call from the dialler in the UE to a business and speaks with an agent about the repair of an item purchased.
2. The agent may want to share information via a business messaging session so the agent initiates sending of a rich card to the user so the chatbot can follow up with further information about the product and about other products the user might want to look at via the carousel. In this case, there should be an indication to the user during the call that messages related to the call have been received during the call.

2.6 Multi-party call

A business can provide services to several users at the same time by using multi-party calls. For example, a multi-party call may be used in many vertical domains, such as online education, where a teacher in an education organization may use a multi-party call to give lessons to several students. During the lessons, the teacher may share documents, do interactive actions with students, and the students may share opinions with each other.

A use case using a multi-party call in online education is as follows:

1. User A is on the staff of an online education organization, and users B, C and D are students which are all subscribers of the online education service. User A calls users B, C and D to give lessons to them.
2. A list of items is served on every participant screen, which includes several operations to be selected by users and then performed in the meeting, e.g. adding members, screen sharing, initiating voting, leaving, etc.
3. User A clicks the corresponding buttons to share their screen to display an electronic student book and exercise document to user B, user C and user D.
4. During the online lesson, user B, user C and user D do the exercise in real-time, and user A can check their students' work and give some guidance to them.
5. Once the online lesson is terminated, an RCS message or an email including a link to the study report is delivered to every student.

2.7   Interworking with online business platforms

This use case involves an online business/media platform in the ecosystem of the business voice calling service. Online business/media platforms are the existing "entrances" to business, and business voice calling can be seen as a new "entrance" to business, and connections between these entrances may be considered.

From a security perspective, CSPs and the online business/media platform need to have corporation agreements on enterprise certification and content verification.

The use case is as follows:

1. A restaurant is subscribed to one or several business/media platforms (e.g. Meituan™, Tiktok™) which have the online menu or promotional video of this restaurant.
2. A customer calls the restaurant.
3. During the call, the customer sees an online video (e.g. Tiktok™ video) of the restaurant.
4. When the call is answered by the restaurant, the restaurant staff provides the online menu (e.g. online menu in Meituan™) to the customer and guides the customer to place an order.

3   Business Models

3.1   Overview

There are multiple parties involved to fulfil various business voice calling services. This section provides an analysis of the business voice value chain and possible business models that can be used among the different parties.

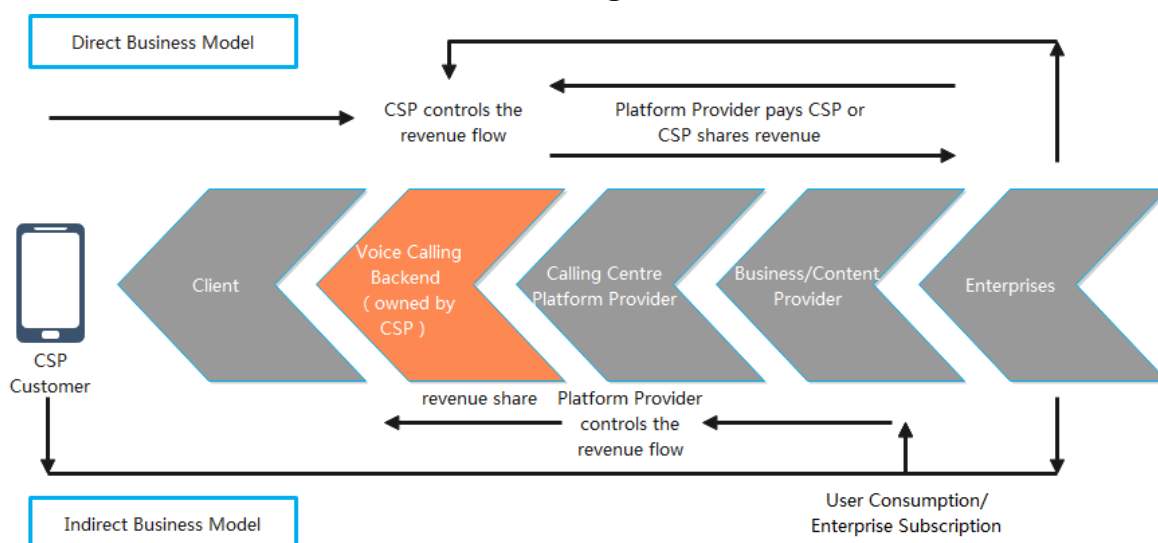## 3.2   Value Chain in Business voice calling

Figure 3: Business Voice Calling value chain

The value chain shown in Figure 3 indicates the core position of voice calling backend providers for enabling business voice communication in an ecosystem manner. Based on capabilities provided by the back end, the calling centre platform provider realizes the business model as a service account. To support business service during a business voice call, it is also necessary to integrate business content developed by content providers and properly present it on the client-side which needs to be supported by UE manufacturers or Operating System (OS) developers.

Note that value chain participants may take more responsibilities than in their traditional roles. For example, in addition to backend providers, CSPs may also take the calling centre role and may in some circumstances also be the content provider. Also, enterprises may develop their own business platform or content production, or even calling centre, although in many cases they cooperate with third-party providers. When taking a particular role, the corresponding agreement within the same business framework shall also be applied to the participant to ensure framework consistency.

3.3   Strategic considerations

With new technology (e.g. data channel, AR/VR) in 5G, business voice calling can be used in much more innovative ways than before with new characteristics such as visualization, interactivity, more feasible applications and more security.

For quicker deployment, the business voice calling ecosystem may involve existing business ecosystems, such as online video or shopping platforms. Cooperation between business messaging and business voice calling could improve the user experience of the business service and could benefit the operators if they develop the two communication services together.

3.4   Charging Models

While charging for individual P2P calls and messages independently remains in some markets, charging through combined bundles has become a more common way for years. In this case, two key models emerge: direct and indirect business models.

For direct business models, a CSP collects value directly from users or enterprises either through the value of transport or from the update of service plans for value-added services. Value-added services may include upgraded capabilities and service subscriptions, for instance, capacity-based calling service for enterprises or user subscription for short videos in ringtone. In such models, the revenue generated from service commission or subscription could pass to the calling centre and content providers for corresponding system development and content production, supported by CSPs or enterprises depending on the responsibility taken.

For indirect business models, the value is collected elsewhere in the ecosystem, for example, through service accounts, and in this case, the calling centre provider controls the revenue flow with a share of the revenue received by the CSP and another share passed to the business/content providers, the role of which may also be taken by other parties such as enterprises.
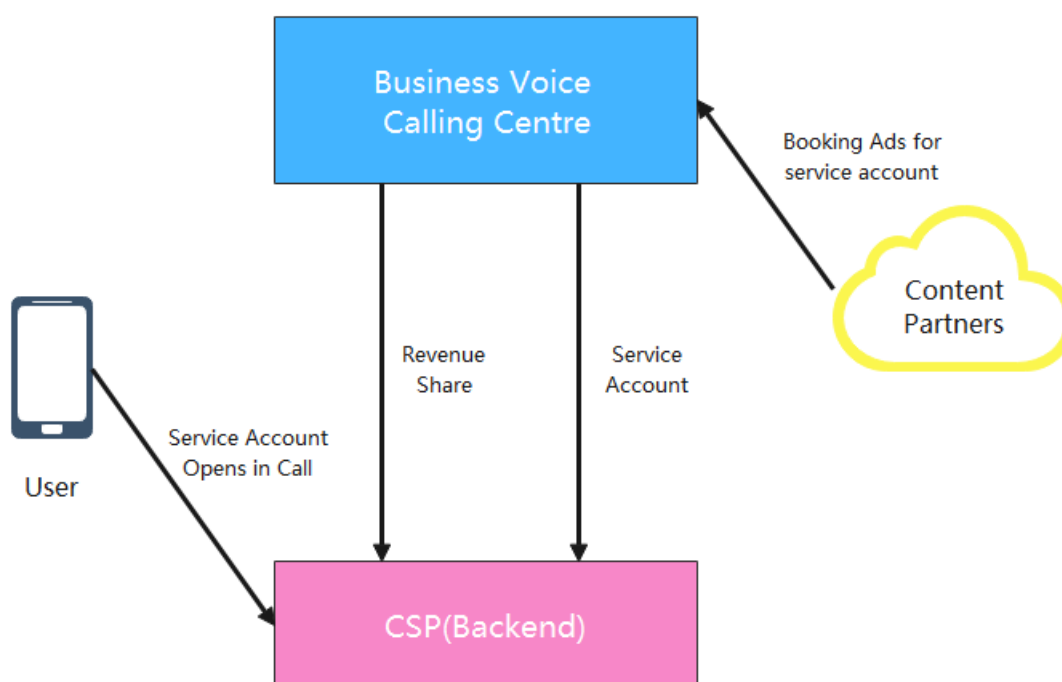
3.5   Indirect business models

Figure 4: Indirect Business Model from Service Accounts

Figure 4 shows the relationship between parties in the value chain for a service account-based indirect business model. In this case, revenue can be generated indirectly via an online platform business. Taking booking ads as an example as shown in Figure 4, the revenue for booking ads is received by the business voice calling centre provider maintaining the service account, from the content partner taking the role of advertising

content production. A share of such revenue could pass to the CSP for providing multimedia capabilities as part of the business voice calling.

In this case, if a CSP decides to partner with a provider of service accounts platform (e.g. a Business Voice Calling Centre), standardized commercial agreements could simplify the process and ensure equitable outcomes for all value chain participants.
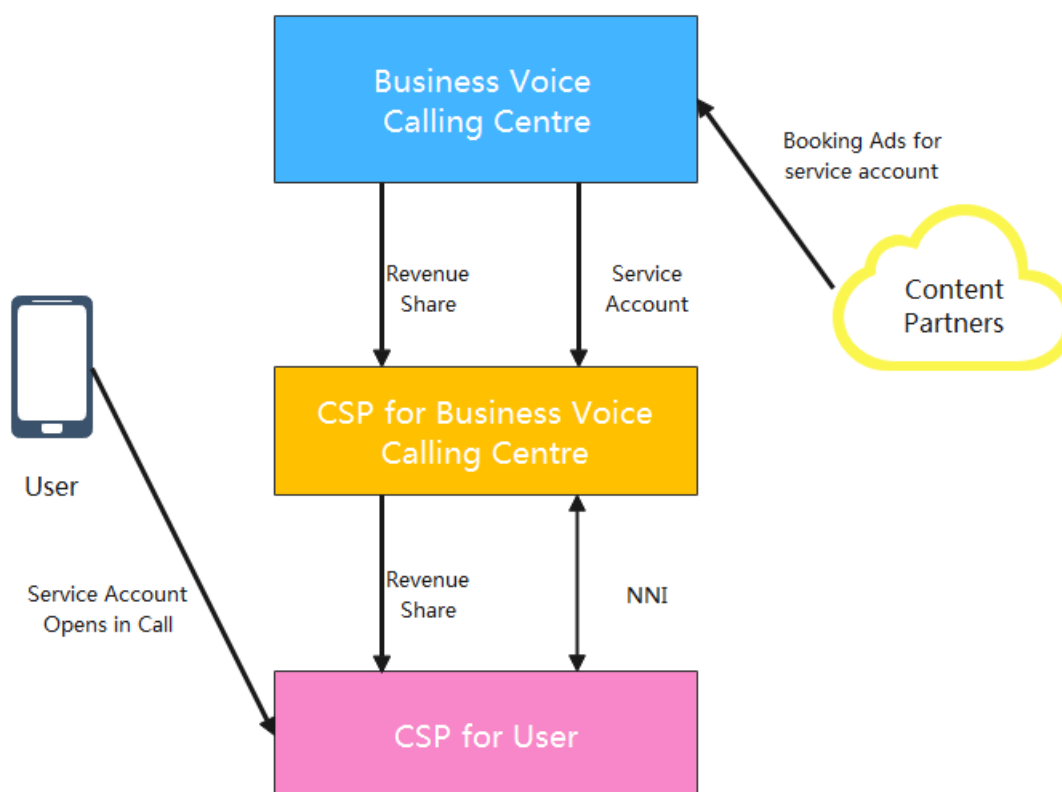

Figure 5: Indirect Business Model from Service Accounts (Multiple CSPs)

While the user and business voice calling centre connecting to the same CSP in Figure 4 is common, there is another common case where each of the users and calling centre are served by different operators for their voice calling service, as shown in Figure 5. While the carrier billing is processed independently, the CSP which serves the business voice calling centre and the CSP serving the end-user may share the revenue generated by the business voice calling centre according to bilateral commercial agreements. For instance, the CSP serving the business calling centre may pass a share of revenue it received to the CSP serving the user.

Another option for future online platform business comes from the inclusion of an AI-Assistant provided by partners (or by a CSP) which makes AI addressable in one-to-one voice calls. The principle and functionality are the same as the indirect model via service accounts. The interaction between clients and partner AI-Assistant could be considered as the future of service searching, and revenue will be generated in this specific voice calling service.

3.6   Conclusions

The business voice calling ecosystem includes various partners, including operators, businesses, and other parties. The business models should ensure that all partners get a share of the revenue received for the business voice calling service. Both the direct and indirect business models will coexist based on agreements among different parties involved in providing the business voice calling service

4   Business voice calling ecosystem

4.1   Ecosystem partners

Business voice calling will work in an ecosystem manner with many partners, such as telecom operators (originating, terminating and enterprise service providers), device vendors, telecom equipment/technology providers, application providers and possibly some new players to provide service to synergise the ecosystem.
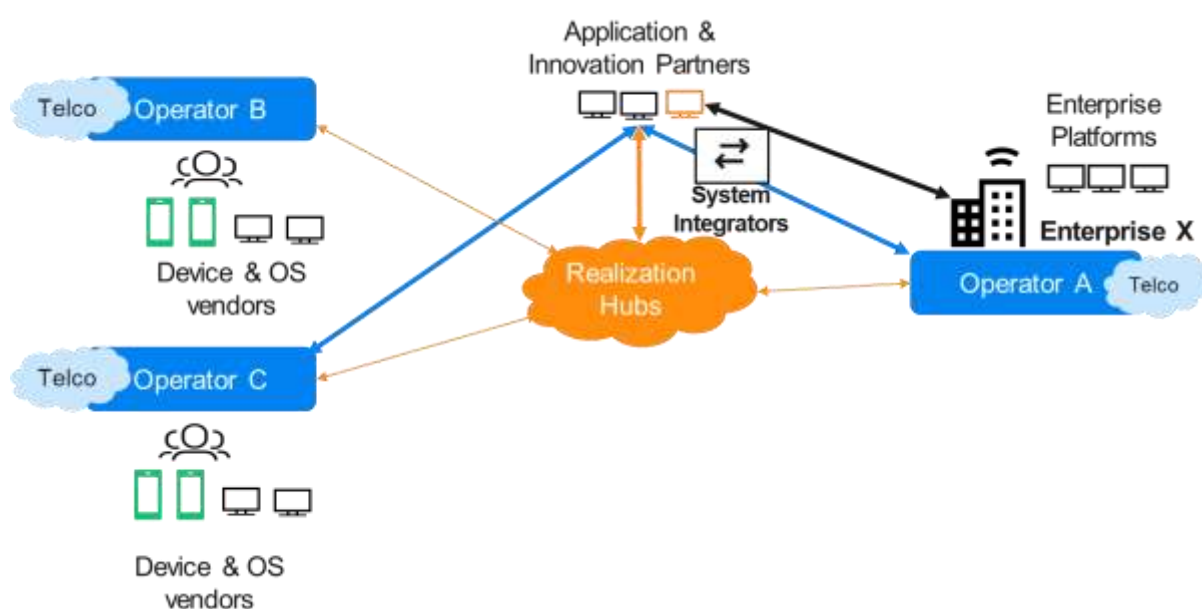

Figure 6: Business Voice Ecosystem

The key players of the business voice ecosystem are, as shown in Figure 6:

1. Enterprises: Enterprises will use/buy the business voice service from operators and enable the services for customer originating (Consumer to Business - C2B) and terminating (B2C) business voice sessions. Enterprises should also be paying the operator for the business voice service.
2. Enterprise platforms: Business platforms that include subscriptions to various business services. Application and Innovation providers provide applications that can connect these platforms with business voice calling by using the open APIs provided by these platforms.
3. Telecom operators: Business voice consumer operators and enterprise enabling operators to provide the business voice service to the enterprises. For example, Operator A will sell and enable business voice for Enterprise X, and then there can be C2B or B2C communication between the Enterprise X and consumers who can be

subscribers with consumer Business Voice operators B or C. Note that operator A can sell the service directly or through its channel partners, to the Enterprises.

4. Device vendors: Device vendors enable business voice calling support in their devices, as per the standards to be set for the ecosystem. The device vendors include mobile handsets and other mobile communication devices that will support business voice.

5. Device OS vendors: Device OS vendors, if needed, to enable required support in the OS to enable the Business Voice service.

6. Telco vendors: Telecom equipment vendors to enable the technology in the core network (e.g. IMS) and systems to enable operators to provide business voice service for enterprises and consumers.

7. System Integration vendors: System Integration vendors to provide the enablement or integration layer for the operator's business voice calling with the business applications (such as contact centre, virtual Private Branch eXchange (vPBX), etc.) of enterprises and application providers.

8. Realization Hubs: Since there will be different operators involved to provide end to end service for business voice calling, some kind of trust and settlement partners are needed between the operators. The other option can be a bi-directional settlement between operators directly.

9. Application and Innovation providers: Application providers are part of the ecosystem to provide standard applications that will be needed to support the business voice calling use cases both for the enterprise and operator side. Innovation providers are the Application Providers who will provide customized applications and innovation use cases based on different enterprise needs. These can also take the role of application providers.

The key to the ecosystem is that it is a cooperative environment where dominance by one of the partners is avoided. Therefore, the value for each partner and the role of each partner should be clearly defined and demarked. This is to be done through alignment with the Business Model.

There can be multiple ecosystem players to fulfil single or multiple roles.

The business voice architecture described in the next section is aligned with the ecosystem described here.

4.2 Alignment with Data channel ecosystem

Alignment between a business voice ecosystem and the IMS data channel ecosystem as described in GSMA PRD NG.129 [5] requires further study.

5 Business voice calling architecture

5.1 Overview

The Business voice calling architecture uses the 3GPP defined IMS architecture and principles as a baseline, with business-specific capabilities added to create business-specific use case experiences and value additions. A reason to use IMS as the baseline is to be able to include standard voice communication (Voice over LTE(VoLTE)/Voice over New Radio(VoNR)) devices and network features in the business communication experience. Since native device capabilities in most cases are limited to the GSMA User-to-Network

Interface (UNI) profiles such as GSMA PRDs IR.92 [2], IR.94 [3] and NG.114 [4], the business experience will be limited to what the profiles can provide. To mitigate this limitation, until a more innovative device native framework is in place, a downloadable business-, or operator-, specific application can be used.

The Enterprise solution is mostly run as its own operative domain. This business solution operative domain can be hosted by the operator or hosted by a 3rd party provider, in an "as a service" fashion for example. Even if the Enterprise solution is running as its own operative domain, the operator provided communication service solution can provide more or fewer capabilities depending on deployment and operational aspects. When the operator delegates the management and operation of the Enterprise solution to a third party, the traffic is routed to/from the Enterprise solution via an Enterprise Network-to-Network Interface (NNI). This NNI can be a subset or superset of a traditional interconnect NNI. See Figure 7.

The operator provided communication solution may offer core IMS capabilities. In this case, the Enterprise solution is invoked via a northbound interface from an IMS AS in the operator provided communication solution. See Figure 8.

Variants of deployments can exist depending on the enterprises served, the relationship between the different operative domains, and on technical and business agreements between the operating actors for the serving solutions. An Enterprise solution can interact with many different operative domains. See Figure 9.

Enterprise Value Added Services and Enterprise Services are services such as those described in the use cases in section 2.
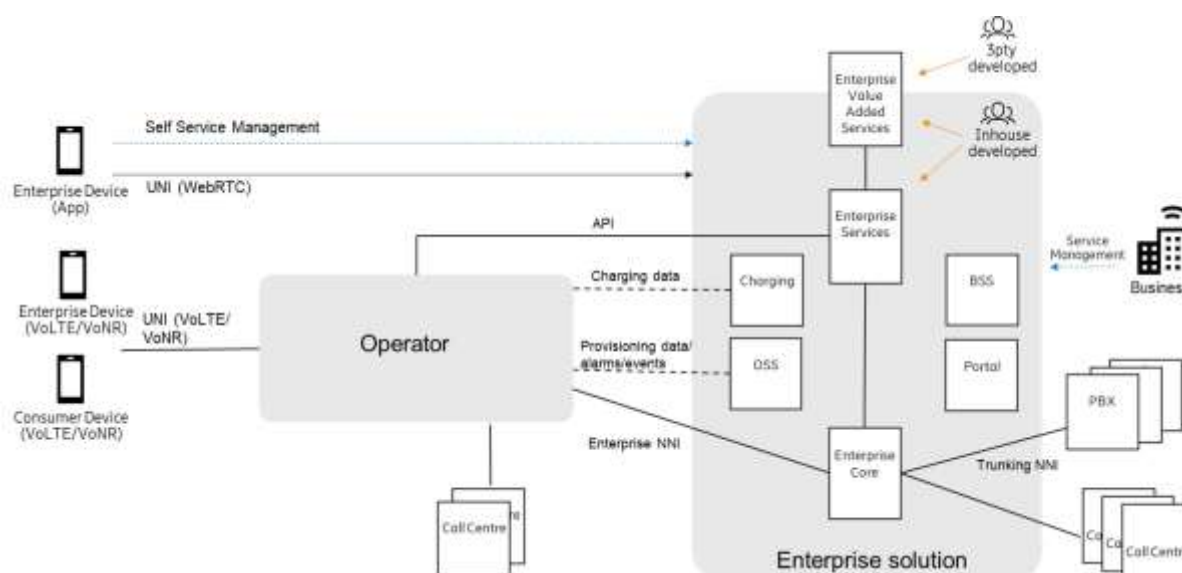

Figure 7: High-level architecture for business voice when the operator delegates the management and operation of the Enterprise solution to a third party
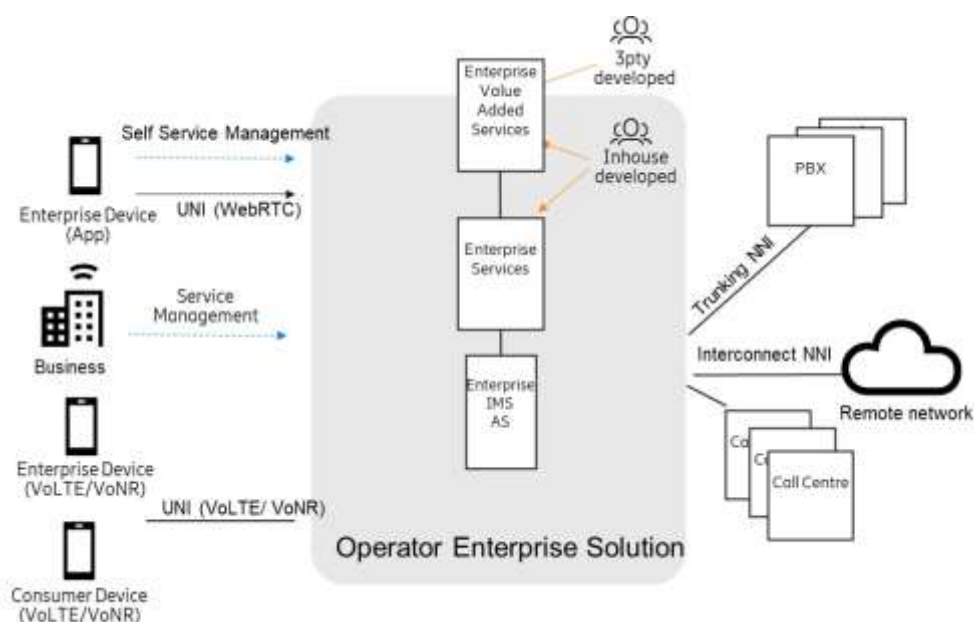
Figure 8: High-level architecture for business voice when the Enterprise solution is invoked via a northbound interface
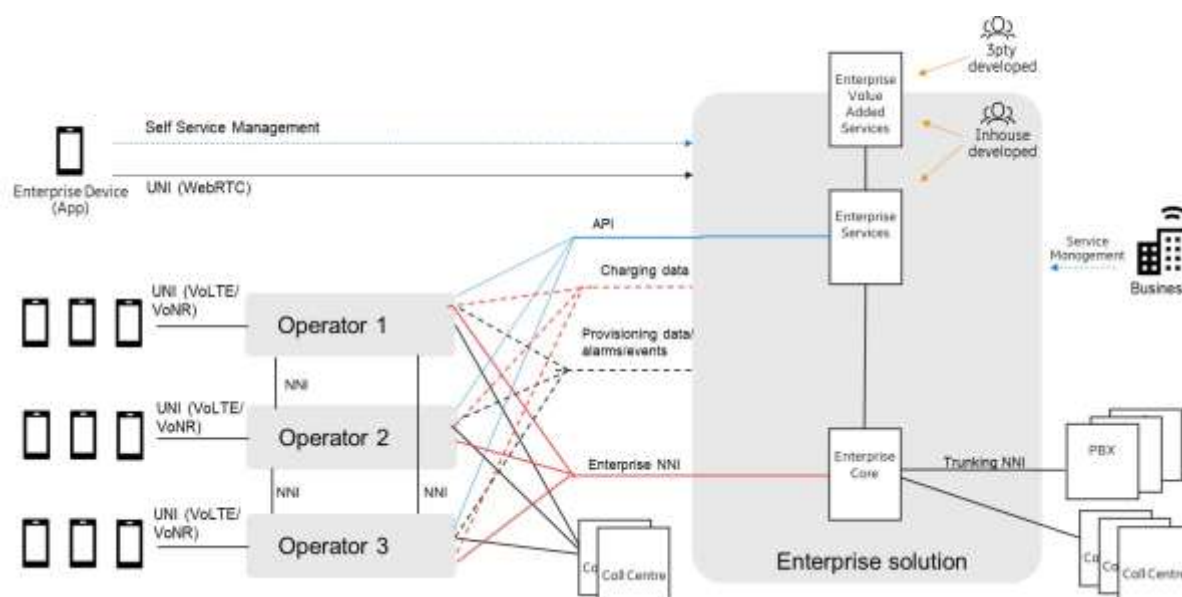

Figure 9: An Enterprise solution can involve communication with many different operative domains

Interworking is needed for communication traffic, as well as for charging and service management. How the responsibility is divided between the different operative domains will be deployment-specific. This is usually done via Service Level Agreements (SLAs). When new services are introduced both technical and business SLAs may need to be updated.

5.2   Using MNO/CSP assets: trust, privacy and security

With the 3GPP defined IMS architecture being used as the basis for business voice, the trust, privacy and security built into that architecture are reused.

5.3   Relationship to Business Messaging

With business voice, operators already have agreements with enterprises to provide a basic business voice service, thus it makes more sense for operators to build on their existing relationships with businesses for voice services to ensure that operators remain part of the solutions for business voice.

Business messaging service began from a different background as compared to business voice where the ecosystem is different from the proposed ecosystem and architecture of business messaging service. Both the services can co-exist under different business models offered by operators to their business customers.

As discussed in section 2.5 there are use cases where business messaging and business voice may be linked at the user interface level or at the API level. How that linkage would be technically realized is for further study.

5.4   Interconnection architecture

If Operator A enables business voice for Enterprise Solution X, then there can be C2B or B2C communication between Enterprise Solution X and consumers who are subscribers of operator B or operator C by introducing interconnection. There will be two interconnection models as shown in Figure 10. The two interconnection models will coexist.
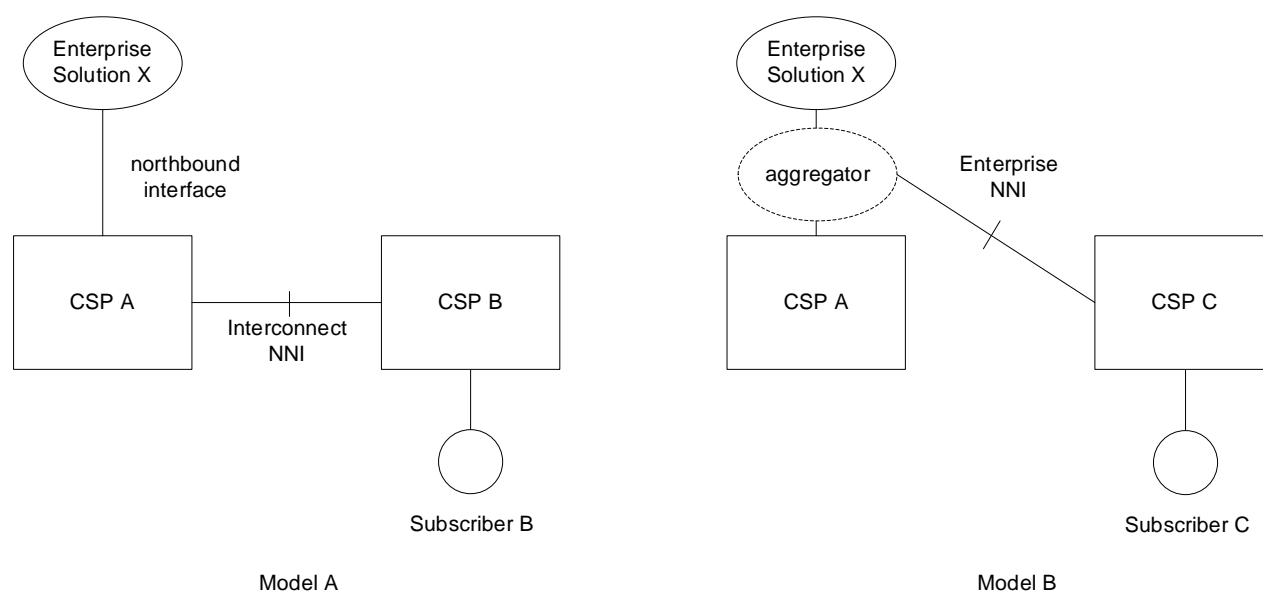

Figure 10: Interconnection models for business voice

Model A: Enterprise Solution X connects to CSP A and communicates with CSP B's subscribers via the interconnect NNI between CSP A and CSP B. In this model, the technical interconnection architecture of the interconnect NNI needs to be updated to cover any new signalling or media that may be used across NNI. An enhancement for enabling the business voice service also needs to be considered. The features of business voice provided to subscribers of CSP B is a subset of features provided to subscribers of CSP A. The features provided to subscribers of CSP A depend on the business agreement between Enterprise

Solution X and CSP A. The features provided to subscribers of CSP B depend on the business agreement between CSP A and CSP B.

> NOTE: The CSPs can be interconnected by a interconnect hub (e.g. CSP A and CSP B are connected to a interconnect hub via an interconnect NNI), in this case, the interconnection model between each CSP is considered as Model A.

Model B: Enterprise Solution X connects to both CSP A and CSP C, or Enterprise Solution X connects to an aggregator and the aggregator connects to both CSP A and CSP C. In this model, the interconnect NNI specified in GSMA IR.65 [1] between CSP A and CSP C is not used for business voice calls but is still used for regular calls. The features of business voice provided to subscribers depend on the business agreement between Enterprises and CSPs.

If the terminating CSP does not support the business voice service or does not have a business agreement with the originating CSP, the terminating CSP could either:

- reject the whole calling session, or
- reject all media data traffic in the calling session (e.g. HTTP (HyperText Transfer Protocol (HTTP) traffic or data channel media traffic) except the media data traffic of the voice/video call (e.g. Real-Time Protocol (RTP)/Real-Time Control Protocol (RTCP)).

6 Summary of Dependencies

This section describes the key dependencies that must be satisfied to deploy business voice services both in the HPMN and VPMN.

> NOTE: If the IMS data channel is used to realize the use cases in this document, a further analysis for some of these dependencies is described in the NG.129 IMS Data Channel white paper [5].

6.1 Operator dependencies

The operator should have an overall plan of calling service before introducing the business voice call service to avoid the conflict between business voice call service and the existing service in its network, e.g. CLIP or Enriched calling service.

The operator's Business voice call service should provide unrivalled value in terms of trusted, private, secure access to services. These functions can be optional per CSP or can be agreed upon in a commercial agreement between CSPs and Enterprise solutions (if the Enterprise solution is hosted by a 3rd party provider).

6.2 Network dependencies

The network should upgrade the northbound interface from the IMS AS or support the Enterprise NNI to enable the interaction with the Enterprise solution.

Realization hubs/partners or operators' alignment and interconnection are needed to align across different partners and enterprise solution providers.

Enterprise solutions should be ready for deployment and supported.

6.3   Device and OS dependencies

Devices and OS should be updated to support the Business Voice service.

6.4   Security and privacy

CSPs should perform business authorization and authentication to avoid spam and fraud.

The security and privacy terms of reference should be agreed upon by end-users before transferring the user's data to the network or the business.

6.5   Charging dependencies

Traffic associated with business voice calling service shall be labelled and identifiable to support charging depending on CSP's service policy.

To prevent fraud calls not labelled as business voice calls shall not be able to use specific business voice features.

6.6   Regulatory needs

Enterprise solution must support the regulatory requirements of the Home Private Mobile Network (HPMN) of the subscriber who uses this HPMN's Business Voice Calling service.

6.7   Roaming

When a user is roaming in the Visited Private Mobile Network (VPMN), the home operator and the local operator both can provide business voice calling service to the user based on service priority configuration.

6.8   Interconnection dependency

The terminating CSP shall have the option to provide a categorisation on the nature of a call originating from a business to their subscriber (e.g. spam, telemarketing, etc.) based on operator policy and verification status.

7   Conclusions and recommendations

This document has provided business voice use cases, business models, ecosystem and architecture to understand the prospects and business value of Business Voice calling. The recommendation is to review these areas in detail and identify areas where further work may be needed in the relevant GSMA groups. Security, privacy, fraud and technical aspects are areas where business voice use cases may need more examination.

Another recommendation and conclusion is for operators to make use of and build upon their existing business relationships with businesses for voice services, and support enhancements required, to ensure that operators remain part of the solutions for business voice.

Annex A   Document Management

A.1   Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	2021.12.09	New white paper		Nancy Greene / Ericsson

A.2   Other Information

Type	Description
Document Owner	IPCOMMS
Editor / Company	Yan Di / China Mobile, Nancy Greene / Ericsson

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