Working Paper

IIMK/WPS/583/ITS/2023/06

JUNE 2023

WhatsApp as a Superapp : Chatbots, Business API and the challenges ahead

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WhatsApp as a Superapp : Chatbots, Business API and the challenges ahead

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Abstract:

This paper explores the transformation of WhatsApp into a 'superapp' through its Business API. Acknowledging the increasing preference of Millennials and Gen Z for chatbot interactions over traditional phone calls, it investigates the potential of WhatsApp to serve as a chatbot aggregator. The effectiveness of WhatsApp's transition is analysed in light of three key determinants: businesses' willingness to pay for messaging services, the adaptability of the chat interface to diverse business interactions, and WhatsApp's capacity to verify businesses for a secure, spam-free user experience. We discuss the probable exploitation of Robotic Process Automation (RPA) tools by businesses to evade the paid API system, thereby questioning the motives behind WhatsApp's transition strategy. The paper also addresses potential spam and scam issues emanating from the app's expansion and the subsequent challenges in detecting and managing RPA misuse. As WA expands its services, it faces an increased risk of spam and scams, while maintaining competition against rapidly growing chat services like ChatGPT. Lastly, the paper explores potential use-cases that could make WA a more compelling platform for businesses, considering AI's integration with WA's API and the future trajectories of AI in revolutionising messaging apps.

Introduction:

With over 2.24 Billion active users as of February 2023 [1] , WhatsApp has become a staple in our daily lives. But the potential of WhatsApp (WA) extends far beyond personal messaging. With the introduction of its Business API, WA has already taken a significant step towards becoming a 'superapp' - a single platform that integrates a multitude of services. These services can range from messaging and social networking to shopping, payments, and more. In contrast to WA user and business app, its API services entail a conversation fee, establishing a long-awaited monetization stream for its parent company, Meta (Facebook). By introducing interactive buttons, clickable menu items and integrated shopping feature, WA has differentiated its API offering from its user and business apps to create a strong case for monetization. We will first deal with a more significant question briefly: Is WA capable of supplanting traditional superapps, or is that even its intention?

Millennials and members of Generation Z have displayed a marked inclination towards using chatbots as opposed to making traditional phone calls when they need to communicate with businesses [2]. Such a preference has been also observed in actual practice by one of the authors in the line of work as a SW product entrepreneur. This preference can be attributed to their status as digital natives, their adeptness with technology, and their comfort with communication channels that don't involve verbal conversation, like various messaging applications. Creation of applications on WA would also help the ‘consumerization’ imperative for Enterprises, i.e.to be able to give employees such software at work that is familiar and intuitive, almost an extension of the Bring Your Own Device (BYOD) movement. WA being the

de-facto messaging app for most people (at least in India as well as Latin America and parts of Europe [3]), can WA be seen as trying to be a chatbot aggregator for the digital natives ? Future changes could also be on the lines of multiple feeds for a user, for example, a tab labelled 'Businesses' could be added alongside 'Chats, Status and Calls', providing a convenient location to categorise all business-related conversations and even discover new businesses. We postulate that this also implies enhanced discoverability for businesses.

The success of WA's API service will hinge predominantly on three elements: (a) the motivation for businesses to transition to a paid messaging service, especially when they have access to affordable Robotic Process Automation (RPA) tools along with a free, existing WA Business application, (b) the provision of features that make the chat interface more conducive for a wide universe of business interactions, and (c) WA's capacity to authenticate businesses to guarantee its users a secure and spam-free service. RPA is a software robot that streamlines repetitive tasks on its owner's screen: often known as *swivel jobs*. Consider having to copy data from one document and paste it into another hundreds of times. Rather than manually undertaking this tedious job, RPA accomplishes it swiftly and accurately. An analogy lies in the *recorded macro* feature of the familiar MS Excel spreadsheet software. Once routine tasks are taken care of, the business owner is liberated to concentrate on more creative, problem-solving activities that might be valuable since they are customer-facing. Factors A. and C. above are closely connected because the intended audience for their API services is likely the same group that will try to bypass the paid API system in WA using RPA tools. If so, could we be witnessing a 'coerced transition' disguised as 'customer acquisition' by WA ? Is it possible that the current 'Secure Business Messaging Application' for Business Users in WA will stay perpetually free so long as business users do not engage in RPA ? This seems to be a distinct possibility.

As WA transforms into a one-stop solution for diverse services, it simultaneously unveils a new universe for spam and scam. Meta is also likely to be sensitive to such criticism since a plateauing of users of Facebook [4] , Meta's original hit product, can be traced to existing users' feeling that the platform had become 'spammy'. The biggest challenge that lies ahead for WA will be to combat a long standing problem of abuse, which will include bulk messaging and unauthorised automated behaviour (RPA), even beyond genuine attempts by business users to cheat the fee-paying API model [5] [6]. There are 2 points worthy of note here: 1. WA RPA Tools might be able to execute specific advertising campaigns on WA, but may not enjoy a long runway of business success since WA's stated policy is that RPA is a misuse of the platform. 2. A technologically involved question is whether Meta can detect RPA bots, esp. when they are struggling even to categorise advertisements promoting products that explicitly contravene their own terms and conditions.

WA would also be sensitive about competition, despite being a behemoth of a platform that has used *network effects* to best effect. To give an example, a chat-oriented service like ChatGPT demonstrated rapid growth, reaching 100 million users in under six months [7]. For an appropriate value proposition, the impressive Daily Active User (DAU) numbers of WA no longer seem unattainable, as we note with WA's relatively-underground competitors Signal and Telegram. Beyond mere competition, ChatGPT (which now has an iOS app) is also signalling a chat-driven 'do-anything' user application for the masses. In a later section, we cover use cases for WA based on ChatGPT that approximate what is already happening on ChatGPT: a prompt on ChatGPT to the effect 'Create a 3 day itinerary for Maldives' can interface with the 'Expedia' plugin to even book the hotel and flights. As chatbot technologies

like ChatGPT, Bard, and Bing continue to refine their multifunctional bots and develop interoperability plugins to satiate the thirst for convenience and monetize for their parent firms, WA will have a significant amount of progress to make lest it become merely another plugin on these platforms, rather than attract their Tech onto its own platform.

A: Background

Launched in 2009, WA is a popular messaging app that allows users to send text messages, voice messages, make voice and video calls, and share images, documents, user locations, and other types of media. After a span of nine years, 'WA Business' was introduced, providing businesses with the ability to connect with customers on a global scale. WA business offers immersive experiences, functionality to showcase products and services, enhances sales, and thus fosters relationships on a larger scale. The same year WA launched Business API, known as WABA through a network of BSPs (Business Solution Providers). WABA, is an Application Programming Interface (API) driven service, that allows businesses to send automated notifications, conduct customer support, link chat-bot automation and even facilitate e-commerce transactions without human attention or interference, all within the WA environment. WABA was initially rolled out in a closed group and even later was adopted only by bigger brands since the expenses associated with server setup and maintenance made WABA impractical for small businesses. But by mid-2022, the democratisation of WABA had taken place with the introduction of WA Cloud API, enabling small businesses to access most of the advantages of WABA at a lower cost. WABA (both Business and Cloud API) enables easy integration of any enterprise application with WA, thus allowing users to accomplish business' internal or customer-facing tasks such as booking movie tickets or cabs, scheduling medical appointments, checking flight status, or even grocery shopping, within the convenience of their familiar chat window. Indian Govt initiatives in digital infrastructure, like UPI for payments and ONDC for e-commerce, have the potential to serve as a significant catalyst for adoption as they can be easily integrated via API with WA to provide all the modules necessary to digitise a small business, an opportunity hitherto open only to big businesses with dedicated IT teams. All this is due to the ease of integration in various applications or interfaces that the business may be already using.

The following table helps to outline the distinction between three services available for businesses on the WA as of today: a free WA Business, WABA and WA Cloud API [8].

	WhatsApp Business	**WhatsApp Business API**	**WhatsApp Cloud API**
Summary	WhatsApp Business is a free app that allows businesses to create a professional profile, send and receive messages, and manage customer interactions.For small businesses seeking to engage with	WABA is a paid API that allows businesses to programmatically send and receive messages on WA in different formats. Businesses have to either set-up their own servers or take the assistance of designated WA Business Solution Providers (BSP) to use the API.	WA Cloud API is similar to the WABA, but the servers are hosted by Meta in Meta's Cloud. Businesses do not need to host the applications that use the API on their own servers. It is a good fit for smaller businesses that are looking for a more affordable and

	customers on WA without the need for programmatically sending and receiving messages, it presents an advantageous choice.	Medium or large businesses that need to scale their WA interactions or integrate WA with existing internal IT systems will find this suitable.	easy-to-use API to scale their WA interactions or integrate WA with other smaller-scale systems either on premises or in cloud.
Purpose	To help businesses interact with customers through WhatsApp by employing customer-facing WA agents	To allow businesses to programmatically send and receive messages on WA by hosting their own servers. Can also be set-up via BSPs.	To allow businesses to programmatically send and receive messages on WA without the need to host their own servers. WA will manage the servers*.
User Interface	Listed as 'WhatsApp Business' app on android and iOS stores. Can be downloaded and used like the normal WA user application. A few additional features that we list below are also available.	No user interface or application provided by WA. Businesses can either develop their own applications that interface with WA to manage conversations or can use easily configurable third-party applications to do this.	
Features	Auto reply for away-message and welcome message. Easy reply-messages which can be saved and be used while replying to customers after triaging their query into one or the other category. Can be accessed by up to 10 human agents and has calling feature (like a WA call) A catalogue feature where customers can place orders. In some geographies,	Can install a programmable 'bot' that can create an automated conversation flow with each customer contacting on WA. Has functionalities such as interactive buttons and menu items which can be used within the chat so that the user can simply click and doesn't have to type, similar to a base WA user's 'poll'. Can be used to interface with any backend application: e.g.: fetch your flight booking information from an external system,create a doctor appointment in a booking application, fetch bank balance or stock portfolio position. Can connect to Third Party applications to create as many chat-agents as possible if manual chat intervention is required. No call and video feature. WABA Cloud API currently does not have cataloguing and shopping features. WA Pay integration available only for businesses in Singapore.	

	businesses have the option to utilise 'WA Pay' functionality, which allows them to receive payments through WA.	
Cost	Free	The pricing structure operates on a pay-per-conversation basis, taking into account the type of message being exchanged. A conversation typically spans a 24-hour window, although in certain scenarios, such as a chat initiated from a call-to-action button embedded in an ad on a Meta platform, this window may extend to 72 hours. Within this timeframe, users can interact with a WABA number and the business will be billed only once for that conversation window. The pricing also changes based on the type of conversation. It is broadly classified into two categories based on the origin of the conversation as either User Initiated Conversation or Business Initiated Conversation. As the name states, it is based on which entity started the conversation (when there is no active conversation window). Business Initiated Conversations are further classified based on their content as ‘Marketing/Promotional’ messages, ‘Authentication’ messages and ‘Service/Utility’ messages. Pricing for each type of message is different, the highest being for ‘Marketing/Promotional’.
Scalability	It is possible to link a single WhatsApp Business number with a maximum of 10 devices. However, the management of customer messages on these devices relies on human intervention, as an individual utilising one of the ten devices must manually respond to messages through the WhatsApp Business application. This also provides the functionality to set-up template reply messages for ‘welcome’	The system can be vertically scaled, allowing for simultaneous handling of multiple users within a single use case. The system can also be horizontally scaled, enabling the management of multiple use cases using the same WABA phone number. For instance, a single WABA number can facilitate thousands of customers browsing through products, checking warranty information, and raising service tickets concurrently, replicating the activities of an entire e-commerce portal within WA.

	and ‘out-of-business-hours’.		
Complexity	Download from the application store and use. With the exception of a few added features, it closely resembles the regular consumer application.	Complex to set up and use.	Relatively easy to set up and use compared to on-premises WABA.
Ideal	Small businesses	Medium and large businesses	Small, medium and large businesses
Use cases	Can be used to share product catalogues and set-up a mini store to drive engagement and a level of automated sales, for example to send QR code for payment after an item is selected from catalogue. Also has a call feature.	The following tasks can be efficiently automated without requiring human intervention by integrating with the business's ERP/CRM/Booking/any enterprise systems: - Handling inquiries about products and services - Managing service requests - Facilitating appointment bookings - Enabling online shopping - Sending personalised messages - Sending notifications and reminders	
Example	An electronics store in the city wants to send across their latest product catalogue to engage with customers as well as drive sales.	Example in the WA Business column to the left works if the customer queries are minimal. We assume that the store only provides product catalogue and manual query services via its WA number.Consider a situation where the same electronics shop wants to use their WA number to let customers raise a complaint ticket where they can also check for warranty status and submit a request for a door-step service. This cannot be automated or manually managed at scale using WA Business alone. They can instead use WABA (Business or Cloud API) to programmatically configure the above use case. They can also interface with their ERP/internal systems to verify customer information, product serial number and warranty status and to schedule a door-step service task based on the location/address shared in the customer’s request. The customer on the other hand will have the convenience of doing all this within a couple of steps by clicking a few buttons (within their WA application) and typing only the bare minimum.	

**A webhook URL can be set-up, which will be notified every time a message is received on the WABA Cloud API number.This URL may point to the business's application server or message processing code which will then decide*

how to respond.

We return to the question of whether WA with WABA is exploring an alternative path to transform into a superapp like WeChat in China [9] ? A superapp is a term used to describe a mobile application that offers a wide range of services and features within a single platform, preferably to the extent of the user not needing any other app or service for any content or transaction needed in the course of a typical day. It goes beyond the functionalities of a typical app by integrating various services such as messaging, social media, e-commerce, food delivery, transportation, financial services, and more. WeChat & Alipay (China), PayTM & Tata Neu (India), GoJek & Grab (Southeast Asia) and LINE (Japan) are a few prominent superapps. It is worth noting that all these superapps are from the east with the US having none, though there have also been examples of superapps finding the going tough [10]. The closest to superapps that are available in the US are DoorDash, PayPal and Uber. These platforms in the US do provide multiple services, but they may not offer the same level of integration and comprehensive functionalities as the superapps found in Asian markets like WeChat or Alipay. The superapp concept is still evolving, and it remains to be seen if a dominant and profitable superapp will emerge in the US market [11]. Amazon, with a level of hyperlocal shopping services and entertainment via Amazon Prime may be called as a Super-App approximation, though not in the sense of an open platform that can be flexibly used by vendors.Having started as messaging applications in China and Japan respectively, WeChat and LINE provide successful examples that WA can look to for inspiration to replicate a similar model in the US.

Could the absence of a superapp in the US be hinting at something more significant ? Whether it's WA or WeChat, both are applications primarily used on Apple or Android devices. For context: Apple accounts for more than half of the smartphones in the US [12] and in 2022 alone it collected $74 Bn [9] in platform fee and related charges from applications listed on its store. The existence of super-apps on any application store not only leads to consolidation of apps/services, but also consolidation of power. The crucial, strategic, question now becomes: does WA possess what it takes to become a superapp and compete against formidable gatekeepers such as Apple and Google ? A recent report profiled Apple, Google competitor Microsoft planning a superapp to wrest power from the former two [13]. Several noteworthy considerations were brought up during Elon Musk's exploration of transforming Twitter into a superapp [14]:
(a) is it advisable from the investor/shareholder view point ? PayPal for example saw a slump in its share price when it displayed an interest to foray into superapp space with Pinterest acquisition, (b) how does the existing user base perceive the app ? Do they see it as an ecommerce app, a payments app, a messaging app, a gaming app or a social networking app ? This perception goes a long way in their acceptance of using this application for services beyond what it originally stood for. The failure of WhatsApp Pay in India is also partially attributed to WA's original 'messaging application' positioning. And most importantly (c) how indispensable can the application become ? We hope that the next 2 sections will identify features which would settle b. and c. above to a high level of affirmative in favour of WA.

B: Use cases adopting the likely functionalities of WABA

Presently, the WA Business Application is used by 50 million businesses worldwide, with approximately 30% (~15 million) from India alone [15]. Reports indicate that a total of close to 500 million businesses, ranging in size, depend on WA as a messaging platform to connect with customers, likely using the regular consumer app of WA. These figures suggest that the

target customer base for their paid API services are already users on their platform and have a good idea of how their business can be aided in its outcomes by WA. In order to encourage these businesses to transition to their paid tier, WA needs more compelling features for automation, marketing, and customer engagement, along with pricing options that are affordable. This section explores through several use-cases the potential add-on features that WA could introduce by utilising its existing infrastructure.

Live-Shopping: An integrated video-call functionality similar to the 'Go-Live' feature on Facebook/Instagram. Businesses can leverage this feature to introduce and promote their products or services. For example, a saree seller can utilise this capability to schedule a WA launch event for their 'New Monsoon Collection' and send invitations via WA to their subscribed customers. The invitation card would have inside it an inactive screen which would go live when the event starts, subject to a customer having accepted the invite. Further alerts and future personalisations can be decided based on whether a customer accepts or rejects such invitations. An automated timely reminder with a button to join the video call, with features to hide identity or own video-stream, makes it hassle-free for the customer to join the event which piggybacks on existing WA functionality to host a conference video-call started by the business. Customers can also be given in-video interactive buttons to reserve or buy designs that catch their attention. A visual representation of this feature is given in Figure 1 below.

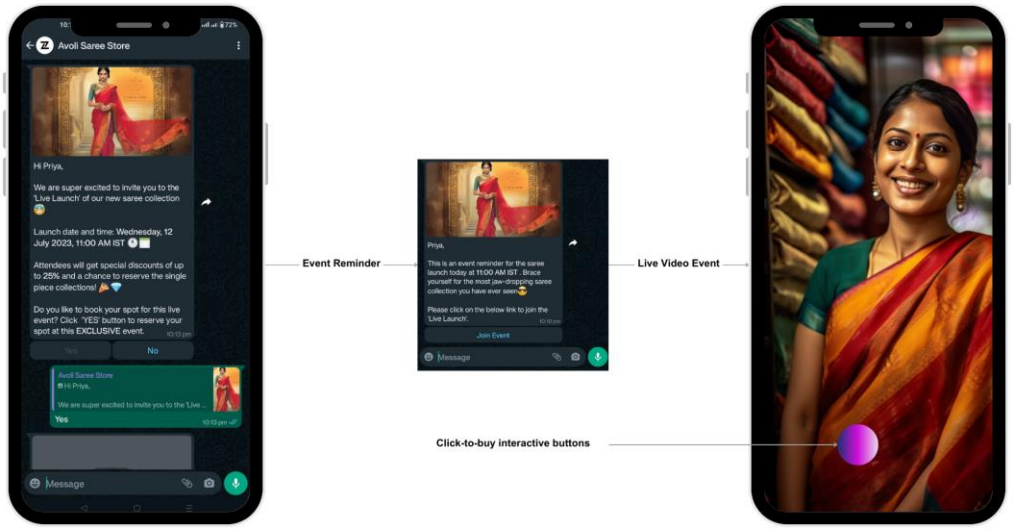


Figure 1

After the closure of the video session, a ‘follow-up’ functionality can be introduced which will let the business share an exclusive catalogue (of the products displayed during the launch) so that the customers can send quote requests or place orders.

Discoverability: WA can introduce a new tab that allows users to search for businesses based on category and proximity (Figure 2). This feature could resemble the 'Near me' functionality found in Google Pay.

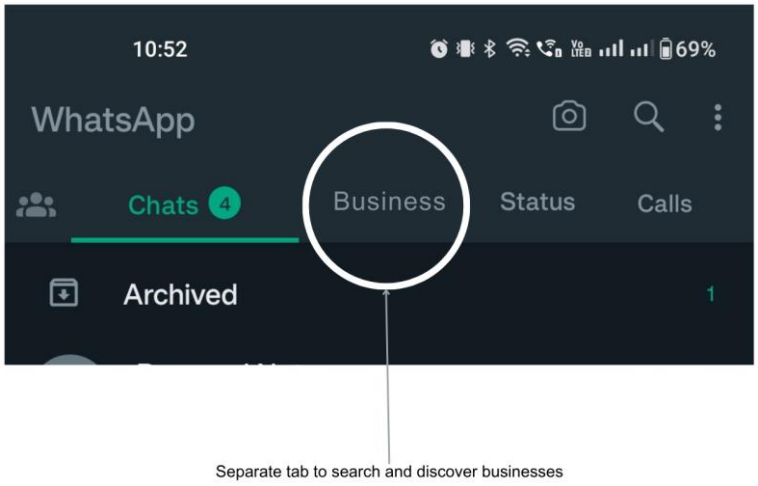


Figure 2

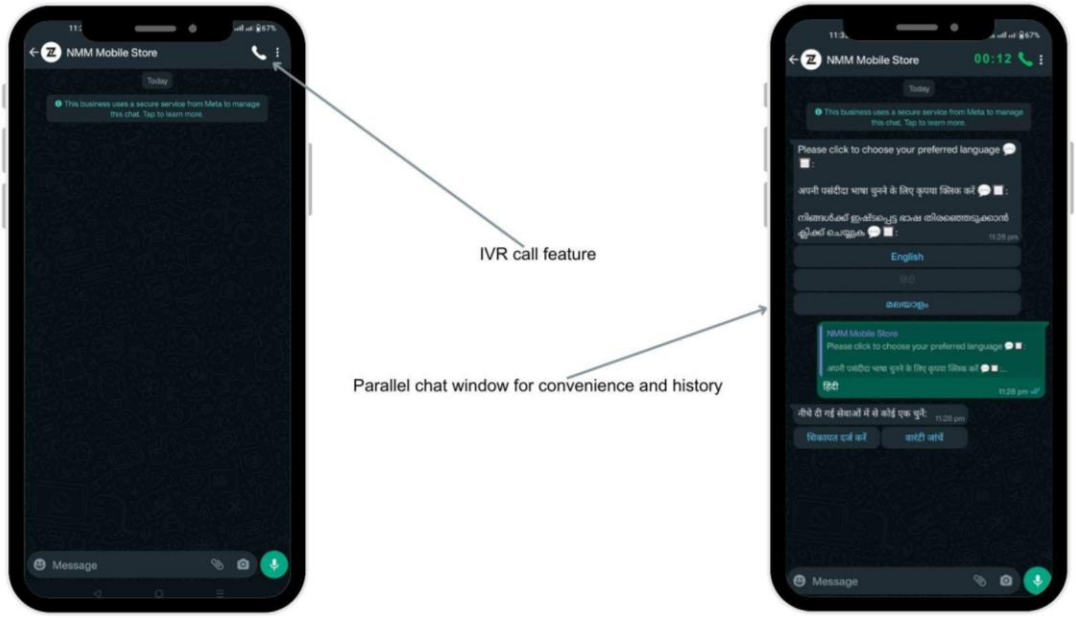
This feature on WA can go beyond just enabling chat or payment capabilities. Users will also be able to complete transactions such as booking services or browsing and purchasing products. Quality of marketing messages and spam are a sensitive matter to WA, hence to ensure the WABA service quality of a business, a score can be assigned to each WABA number. It can be a cumulative score based on all contacted users' feedback about this business and WA's existing message quality score for the messages generated by a given number. Message quality score is an internal indicator used to rate WA API numbers based on user interactions (open rate and response rate). The message quality score is currently being used by WA to also identify spam.

Secure Window Shopping: WA has the potential to introduce a hashkey or hidden profile feature, enabling users to trial/use a business's WA service without having to compromise with their privacy or get identified to the business due to their mobile number being visible. This feature though prioritising user privacy will also attract more digital walk-ins for the business, thereby increasing the likelihood for driving future sales, esp. if WA can provide the business with a permanent identifier, or hashkey, that is not a mobile number (for marketing analytics purposes of the WABA business). It could be likened to the sandbox feature on Google's Play Store or the playground feature commonly found in Software-as-a-Service (SaaS) applications, which allow users to try out an application or service without the need for signing up.

Businesses can leverage this functionality to send notifications to users who have anonymously subscribed to receive updates on offers and discounts. This feature can be combined with the previously mentioned 'Discoverability' feature, allowing users to subscribe for 'discounts on sanitaryware products' in their vicinity for example. By utilising the broadcasting feature, businesses will also be able to send notifications specifically to 'interested users located nearby' that WA will activate for the WABA user by providing hashkeys rather than actual mobile numbers.

Interactive IVR: WA Business has a ‘call’ feature since it is human operated, but WABA does not yet offer any calling feature since it is API driven, hence the fear that

Figure 3



calls might be automated robo-calls. However, if the core offering of WABA is automation and scalability, an obvious option would be to introduce an IVR call feature. WA can further enrich the user experience by also introducing an option to view the IVR commands as interactive messages in the chat window (Figure 3). This will also help the users/customers to keep a history of their IVR operations in the chat window of the respective business.

C: Feasible applications of WABA-API with current AI

In this subsection, we focus on what the emergence of Large Language Models (LLMs) has accelerated, in particular the pace of Artificial Intelligence (AI)-driven automation. OpenAI, at the forefront of the present foundation model race in AI, has prompted businesses worldwide to harness the capabilities of LLMs using API integrations. Though the data policy frameworks for these LLMs are as yet unclear [16], there are a growing number of live use cases from customer support to healthcare and this is generating a sense of urgency (Fear Of Missing out or FOMO) for businesses that already have adoption for WABA at scale [17]. AI, be it in the form of image recognition, NLP (Natural Language Processing) or generative AI (LLM) if used appropriately can make a transactional journey for the customer/user and the business easier and give the appearance of being a natural conversation helmed by humans. Given below are some use cases where AI can be integrated with WA API.

FAQ BOT: A straight-forward choice for businesses is to develop a FAQ-bot on WABA by utilising a set of frequently asked questions (FAQs) from their own website or manual. To enhance the user experience and facilitate browsing of FAQs, they can also categorise these FAQs and even employ a similarity search to identify the most relevant FAQ pair based on the user's query. A user might find that browsing through a website FAQ might be easier in this case. This is where LLMs come handy. Businesses can give an option for the user to type their query on WA, or be able to transcribe from an audio message that poses the question. This user query can then

be used to make a simple API call to ChatGPT, accompanying the prompt with relevant context of the business's FAQs to generate a human-like response. This functionality can be utilised by brands and businesses to assist customers/users in inquiring about warranty terms, return policies, product manual and other related information. This can also be used by large organisations to manage internal HR or audit related queries.

Service Support: The traditional support-ticketing process typically involves users having to identify the nature of the issue, provide a detailed description of the problem, attach relevant invoices or supporting documents, and then wait for a resolution. However, businesses now have the opportunity to automate this process using the capabilities of Large Language Models (LLMs). By utilising the WA interface, users can key-in the problem they are facing as a text or audio message, and businesses can leverage LLM APIs, such as ChatGPT, to comprehend the user's text (issue). In response, the system can provide various parameters including the 'type of issue', a 'synopsis of the problem', 'possible resolution', and 'troubleshooting steps' to offer real-time support and assistance to the user, besides forwarding the ticket to the appropriate customer support group. This automation helps streamline the support-ticketing process and enables businesses to provide prompt and efficient customer support.

Personalised Recommendations: AI-powered recommendation systems can be integrated with WABA to offer personalised product and service recommendations to users. By analysing chat behaviour to understand click probability, AI algorithms can suggest relevant products or services through WA chatbots. Based on the user, these algorithms could be capable of generating personalised marketing/promotional messages from the base content and even attach the most appropriate media objects (image, video, voice or document). An automatic check on such messages would be the per-conversation fee due to WA if the conversation is initiated by the brand, and WA's own quality score that could result in a blacklisting of the WABA no. (for the particular customer who chooses 'block').

Customer KYC: Ensuring ease of onboarding has always been a key area of interest for businesses. With governments across the globe tightening their regulatory frameworks, most businesses have to now take their customers through multiple levels of verification before onboarding them. This is not only time consuming, but also can lead to customer drop-out. WA as a familiar platform can be used to ease the process. With AI integrations, businesses can use image recognition to instantly verify against a source database any ID proof image that was uploaded by the user (picture of Aadhar Card, Driver's License or Passport). This API based image recognition can also be employed to identify serial numbers and warranty registration IDs from pictures shared by the user. Such IDs usually contain 16 or more digits making it difficult for people to type these.

D: Applications based on the AI trajectory

In this 3rd section, we conceive of use-cases based on how AI is poised to revolutionise the way we communicate with messaging apps. The possibility of conversations more intelligent, intuitive, and personalised exists and this must be exploited by any messaging-based superapp. WA can leverage powerful LLMs (e.g. Meta's LLaMA) to automate tasks, such as

scheduling appointments, making reservations, or even managing finances, thus simplifying our daily lives to an acceptable level of error. Chatbots may become increasingly human-like, capable of engaging in natural and dynamic conversations with a brand on a user's behalf, making the user experience enjoyable as and when the user chips in to observe results or take the negotiation over. Messaging apps like WA have the potential to democratise bots, which means businesses in the future may have to handle (via their own bots) two versions of each customer: the human user and bot representing the interests of such a user.

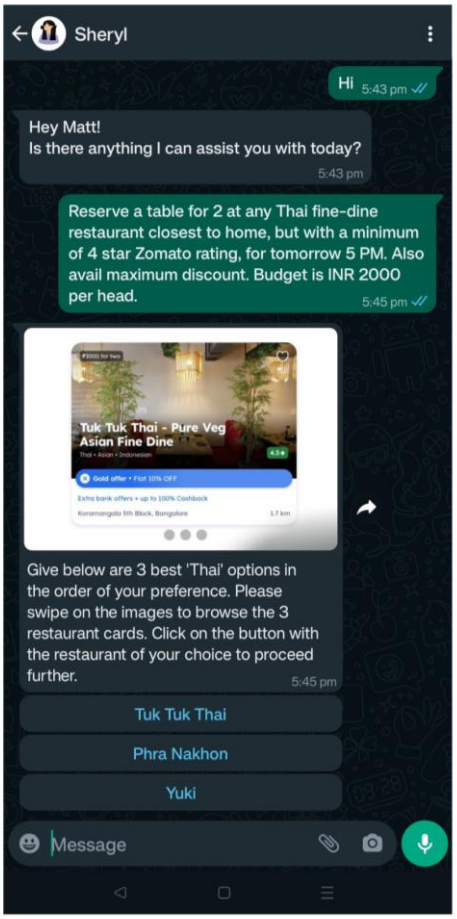
WA Avatar: The use of personal assistance chatbot is expected to become commonplace, and there is a possibility of a default 'WA avatar bot' being introduced for every WA number. Let's call this avatar bot 'Sheryl' for brevity. Sheryl would resemble the current 'message yourself' feature on WA but with additional functionalities for training and interacting with it. The underlying language models (LLMs) could be stored within the WhatsApp application on our smartphones, guaranteeing prompt responses and ensuring data privacy. Furthermore, Sheryl is likely to possess capabilities to handle various tasks such as managing finances, paying bills, storing coupon codes, invoices, and warranty receipts, as well as engaging in messaging and negotiations on our behalf. This development would usher in a new era where user bots interact with business bots to facilitate transactions such as making restaurant reservations, booking cabs, or scheduling appointments.

An example would be the following: A user gives Sheryl the following command: '*reserve a table for 2 at any Thai fine-dine restaurant closest to home, but with a minimum of 4 star zomato rating, for tomorrow 5 PM. Also avail maximum discount. Budget is INR 2000 per head*'. Sheryl may reply with a message to reconfirm if it has rightly understood the user prompt. Once a confirmation is provided, Sheryl may use existing user preferences (if any) and message Zomato's WABA number to list out the top 10 Thai fine-dine restaurants based on proximity, star rating and budget. Sheryl could then use the credit card information, with any specific cards such as Axis Bank Neo Card or HDFC Dine-Out Card, to browse for offers and then proceed to check for table availability. Sheryl can either go ahead and 'reserve a table for 2' at the 'closest restaurant' or can notify the user about the 3 best available options, in the form of cards highlighted for attention from the user as given in Figure 4. The user can then choose one and let Sheryl complete the reservation process.

Figure 4

Sheryl can also serve as a proxy for users by receiving and categorising business notifications on their behalf. It is possible that businesses will be able to consistently inform their customers about the latest offers by modifying these for a particular user's Sheryl, such that a negative impact on their message ratings doesn't occur. Based on user preferences, Sheryl could also potentially communicate with other human users on our behalf. A use case would be where Sheryl replies on your behalf to your loved ones: example would be a reply to your mom's text asking 'When will you reach home?' with a human-like response that says '*Mom, I am on my way back home. Will reach in 10 minutes.'* Sheryl may also have a provision to attach the current location as a media with the message. By integrating Truecaller for WA calls, WA appears to be bolstering its position in the realm of Voice over Internet Protocol (VoIP) calls too. Sheryl could also be utilised to provide context-aware responses for unattended, cancelled, or

missed voice and video calls. This intelligent auto-reply feature could be configured similar to alarm settings, ensuring privacy and giving us full control over who, when, and what messages are handled by the avatar bot (e.g. an elaborate message for named contacts, a simpler one for unnamed ones). Another compelling use case for Sheryl would be to monitor specific activities or feeds in order to notify the user or initiate relevant actions. For instance, if a user intends to purchase gold or stocks when they reach a certain price, Sheryl can keep a vigilant watch over the status messages of brands' bots and provide timely notifications or even take appropriate actions using authorization on WA pay. SME businesses can utilise Sheryl as a "business assistant" to carry out various tasks, which can range from operational activities like scheduling pick-up requests with delivery partners to executive assistant duties such as managing meeting and appointment schedules.



Government-operated road transport organisations, such as the Kerala Road Transport Corporation (KSRTC) and those in several other states, could utilise bots powered by WABA and LLMs to enhance the commuting experience. For local and short-distance routes, where online booking is not provided, these corporations could potentially integrate their hand-held ticketing system with their online servers. This integration would enable commuters to ascertain the crowd levels on buses on their desired routes. Take, for instance, Seem who wants to travel from Wayand to Kozhikode at 11:30 AM. She could pose a question to the KSRTC chatbot 'Sahayatri' along the lines of, '*Are there any direct buses headed to Kochi in the next half hour ? The bus should stop at any bus station or stop within a 2km radius of my current location. Exclude buses that are overcrowded and charge more than INR 300.*' Sahayatri, which for technology purposes is just the WABA API + LLM programmatically handling the KSRTC mobile number, can then query the KSRTC online server to identify buses matching Seema's criteria. For all the buses that fulfil Seema's criteria, Sahayatri can compile extra data such as fare, passenger numbers, and seating capacity incl. for women's seats, to evaluate both affordability and crowd levels respectively. Sahayatri can subsequently supply a list of available buses (if any) for the requested route or even offer suggestions for buses departing in the following hour. Alternatively, Sahayatri can also propose different travel routes using connecting buses.

Like the intelligent auto-reply above, Sheryl could also potentially be provided with a contextual "note" to guide its responses. For instance, in the case of a user who has been involved in an accident, they may receive numerous messages from concerned friends and family inquiring about their health. Instead of having to reply to all their messages separately, a small note can be given to Sheryl for example: '*Today, at approximately 9:30 AM, an accident occurred on the 9th Cross Road in Bengaluru while I was on my way to work. A motorcycle ran a red light and collided with my scooter. Fortunately, I only sustained minor bruises. Currently, my friends Aditi and Aman are with me at the hospital. All necessary scans have been conducted, and apart*

from some small bruises on my arms, I am perfectly fine and will be discharged later today.' Sheryl will now hold conversations based on this context as given in the Figure 5 below:

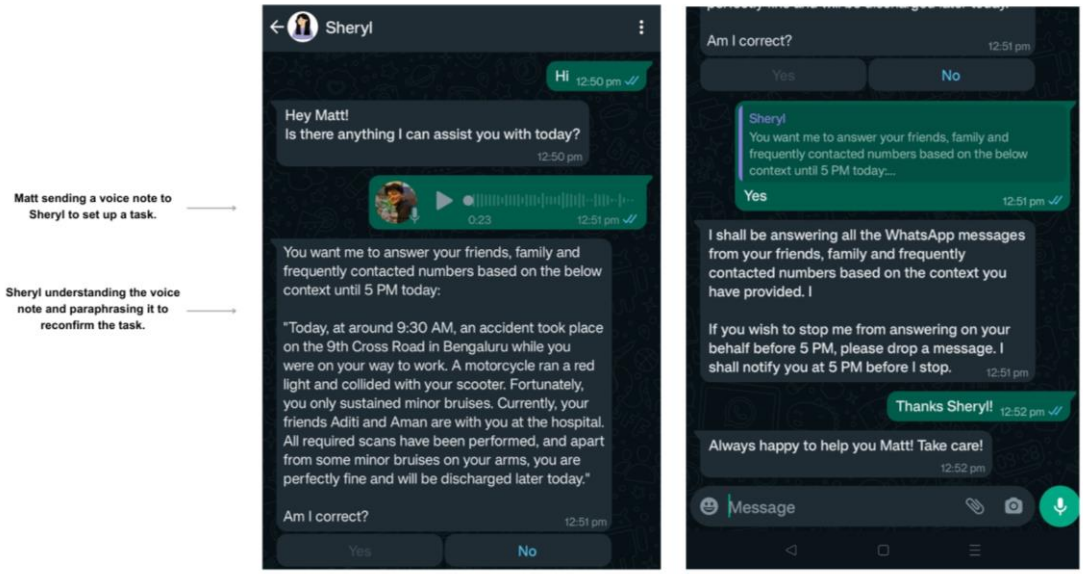


Figure 5

CAPTCHA for Identity: On most websites, we often encounter a 'CAPTCHA' challenge that aims to differentiate humans from bots. Similarly, businesses and government agencies may require a similar identity verification process before we can sign up or access specific services. WA has the potential to introduce 'ID bots' as part of its WABA API offerings. These ID bots could utilise the user's WA camera to securely capture images or videos without displaying the media in the chat, to extend the KYC functionality that is already permitted. Subsequently, they could interface with the government's 'Identification Layer' to discreetly verify the user's identity [18]. To enhance security, this capability could be further enhanced with in-video features that prompt the user to perform a specific pose or speak a displayed keyword.

As brands compete for customer attention, engagement, satisfaction, and loyalty in the pursuit of acquiring, retaining, and winning over customers, WA has much to consider. With Meta's advertising revenues seeing a steady decline each quarter, it's crucial for Meta to explore beyond 'ads'. While WABA offering has already initiated new growth pathways, its success as a dependable business communication and service channel will largely depend on how effectively WA can control spam and scam. In this pursuit, it will also need to collaborate closely with governments to ensure compliance with local regulations and laws [19]. A misstep resulting in a temporary ban, rightly timed with a 'Signal', is all it will take to erode an entire country's user base.

A large user base may not be as much a moat anymore and WA needs to adapt to the changing user needs [20]. The rapid growth in the user base of applications like ChatGPT clearly demonstrates that even non-FAANG (Facebook, Apple, Amazon, Netflix, Google) companies can attract significant user interest if they provide an immediate value to the users by creating a direct impact on their daily lives.

Also, attempting to mimic the roles of 'Snapchat', 'YouTube', 'Telegram', 'Facebook', 'Uber', and 'Amazon' simultaneously may not be the most beneficial strategy for WA, contrary to what the success of superapps might suggest. WA can either stick to its roots, continuing as the messaging application it is and use its WABA offering to add value to businesses and user alike, or it can attempt to transform into a feature-packed superapp, filled with an array of buttons and options, potentially facing a gradual decline similar to Viber.

Therefore, in conclusion, it is our view that before initiating any such transition, WhatsApp needs to recognize its existing strengths and enhance them with a focus on user-centric strategies that involve WABA and no loss of existing use-cases, as opposed to Meta’s habituated ad-centric approach.

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