

Review of Interactive Communication Systems for Business-to-Business (B2B) Services

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Abstract

The ability for any company to efficiently interact with customers, process their requests quickly, troubleshoot problems, shortly speaking – to be “agile” in company-customer interaction, is one of important keys to its success.

The ways of how businesses are interacting with their customers, the way they are advertising their product has been changed and improved drastically and gone to another level with appearance of the Internet, mobile technologies and Artificial Intelligence systems. During last decade, it became even possible to offload the part of interaction with client from human to machine.

Businesses and companies who use this type of approach are capable to keep 24/7 availability for their customers/clients, which in the end helps to increase number of customers, maintain efficiently existing ones and continuously improve product quality based on more structured and organized conversation data analysis.

In this paper the following topics will be covered: business-to-business (B2B) communication aspects, chatbots and their usage as a tool for providing businesses with ability to interact more efficiently with their clients (B2B and B2C interactions), and discussion of chatbot creation platforms that support Facebook and integrate in social network’s environment. Current work represents an analysis of three chatbot creation and management web platforms: Chatfuel, ManyChat and “It’s Alive!”. After that, this work gives comparative analysis of each of these platforms’ capabilities, strengths and limitations.

Index Terms – human-computer interaction, chatbot, smartphones, artificial intelligence, process automation, B2B and B2C, business and management.

Introduction

Nowadays technologies are rapidly evolving and most companies are not managing to follow those rapid innovations in software applications and frameworks. Therefore, the bigger is company the more time it may require to migrate from one software/system architecture to another. At the same time, every company, in order to be competitive and be able to survive, must be able to run the business smoothly, without interruptions. When a company becomes larger and acquires more number of end-point clients (who eventually consume or use the company’s product), it might become harder to keep quick and efficient interaction with them, troubleshoot problems, answer to requests and so on. That is why for the companies to be more successful and profitable, it is common to spend certain

amount of time and investments on defining the best strategy for answering to the following questions: “*How are we going to interact more efficiently with our customers? What services can we provide so that each customer will feel that they are unique and that they won’t experience any delay when they ask us questions?*”

B2B and B2C interaction aspects

Business to Business (B2B) communication is applicable to those companies who want to advertise their product or service exclusively to other businesses and not to consumers. Business to Consumer (B2C) applies to those businesses that want to market their goods or services to consumers [1]. B2B and B2C websites are companies that through their website attract potential customers and in some cases, customers can purchase products and or services through their website. The major differences between these two is that B2B conducts business transactions between other businesses, while B2C conducts business directly with the customer cutting out the middle man.

According to the research (Cornelissen et. al. [2], Ernst et. al. [3]), the significance of marketing communications for B2B companies is related to various procedures. Marketing communication is inherently a process of informing the target audience about the product and its properties. The very core for any company’s success lies in the appropriate determination of the market where customers are most likely to be interested in its marketing campaign. Even the recognized market giants are focused on certain customer groups to promote their products. The marketing communication system includes a set of specialists, tools, channels and direct and indirect links to the customers (messages to them and their reactions) involved in the process of interaction between the marketing system and the external environment. Respectively, marketing communication experts of the company need to deeply understand that one can effectively convey a marketing message to the consumer using a wide variety of methods [4].

Each business has their own strategy on how they communicate to their customers and that strategy depends on many parameters like the type of services that company provides, the number of customers that it currently has (and also anticipates to acquire in near future), customer archetype (age, gender, ethnicity, etc.), geolocation, and so on. One thing that many companies take into count is customer segment aspects. If a company specializes in selling cars and has in average of three thousand new customers per year, the communication aspects are different from company which develops social media type application (for example, mobile applications like Snapchat or Instagram) and enrolls thousands of new users per month.

The communication and (or) interaction aspects are not only different within B2B and B2C approaches, but it is different within the type itself depending on B2C specifics – type of product business provides for consumers, number of consumers, whether the product is real or virtual, should be updated or not (in case of virtual product), etc. Some businesses feel “good” and “comfortable” by simply sending appointments and reminders through SMS (Short Message Stream) channel, for other ones the ability to process high volume e-mailing is the main tool of doing business successfully (payment approval, work orders processing). The others may become even more successful by integrating social media and activity channels in day-to-day “interaction” process with their customers (custom developed instant messaging mobile applications, social media applications like Facebook, Twitter, Instagram, Snapchat, etc.).

One thing is clear for sure: in the majority of cases the company itself is concentrated on the process of creation and upgrading of its own products and services

, so that the advertisement and product marketing stages are usually done by other 3rd parties. Saying that, companies just pay other companies for being able to advertise and later on dynamically (interactively) communicate to clients. And this is the way of how the B2B works in general. One business provides means and tools for other business to be operational from any (including communication) perspective.

The world of marketing has changed a lot in the last 10 years. Marketing communication is not all about fancy advertisements and aggressive sales pitches. A significant part of it is sharing clear and consistent messages and building recognition within the industry and, to a certain extent, outside of it too. For example, IBM is a world recognized company that everyone has heard of, even people who do not work in the information technologies industry. In other words, B2B markets are slowly becoming more and more brand aware. Traditional B2B marketing tools are no longer advanced enough to create and deliver powerful brands. Therefore, marketing communication in a crowded and competitive marketplace needs to have a balance of important marketing elements including traditional, conventional and online elements. Developing a well-adjusted, sound and cost-effective marketing communication plan will certainly support B2B companies in their struggle to survive in competitive industries [4].

B2C traditional ways of interaction versus chatbot based interaction

B2B software applications and platforms can provide necessary tools for B2C successful future work. The reason is that most of the times B2C interaction requires constant communication and dynamic interaction between a business and its customers. In recent years recent years with boom of AI technologies and intense development of communication automation tools, B2C archived a very powerful tool in its arsenal – chatbots. Flyers, phone calls, e-mails and hard copy mails, even SMS messages and all the other “tools and means” make businesses run successfully their daily interaction activity with customers. However, having an

automated software system, which will be capable to interact with and provide 24/7 assistance without interruption or regardless of the number of the customers (at some extent), this might escalate a company’s interaction/communication ability to a much higher level.

Therefore, with so many communication channels available, how do businesses decide which one is better for them, or combination of which interaction channels will bring them the highest profit, will keep their customers satisfied and will require minimum cost from them? One also should take in consideration following aspect: even by choosing certain interaction channel with customers and using it, that channel may affect the numbers of end point clients (increase or decrease it). Having so many interaction channels spectrum does not necessary mean that using all of them will beneficial for a company [5].

Since early 2016 chatbot interaction based technologies started emerging and being more and more excessively used in the world [6]. Mentioned article highlights that companies are slowly starting to leverage chatbots as a way to manage basic communication tasks that used to belong solidly to the realm of human capabilities. Certain communication tasks will probably always require a human touch: marketing, PR, sales, more advanced customer service, and so forth. Where chatbots prove most useful, at least for now, is in the basic, more “automation and routine work” areas of interaction. H. Borisov, the director of product management at Progress [7], used the example of chatbots that their company built for hospitals. The software product was able “automate the process for patients to book doctor appointments by talking to a chatbot”. Chatbot was also capable to do natural language processing meaning that the system was trained to understand different intents or conversations. Booking an appointment or contacting an operator are two examples of conversations that the software system was capable to understand. According to Borisov’s researches the price for managing and supporting those kind of automated systems will not be so high [7].

Chatbots at early stages

The very first chatbot was created by Joseph Weizenbaum, first presented in 1966 and named ELIZA [8]. It was based on natural language processing (NLP) approach and computer program was developed at the MIT Artificial Intelligence (AI) laboratory. ELIZA was utilizing a keyword coordinating strategy and was designed to show human and machine interaction. The thought was to process the participant responses (or questions), look for keywords, extract them and if a catchphrase was recognized, then the appropriate response was posted. In the case when no catchphrase was present, ELIZA would proceed, as per indicated principles, to get more data from the client to keep the discussion going [9]. Although it was not that accurate in terms of responding but it was the one of the new trend at that time, so the people were surprised by its response. This was the first approach to “pattern matching” based interactive conversational system [10]. The chatbot does not comprehend what it is stating. It just creates about as indicated by guidelines and for this situation there was a control connecting family and mother. At that point it needed to create an answer that would urge the client to present

another question with the trust of finding a keyword. But more often than not ELIZA gives standard answers if a keyword is not found.

Nowadays chatbots are being used as instant messaging systems such as Facebook Messenger (or just Messenger), WeChat, Kik, Telegram and many more (fig. 1). One of the biggest challenge that chatbots face is providing more accurate and meaningful results and correspondance to human inputs.

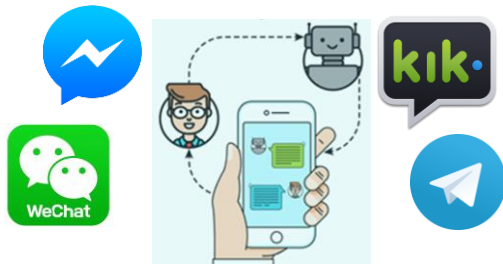


Fig. 1. Conversation between user and chatbot from through mobile device

However, the more advanced versions, which are supposed to be more improved and “smarter” for businesses (to be able to use them and gain benefit) are grounded in AI and are capable of understanding conversational phrasing. These “new generation chatbots” are programmed to actively learn from previous conversations so they would be able to constantly grow and develop. In practical terms, this allows businesses to increase their efficiency and reduce overhead. The reduction of staff for repetitive processes requiring customer support employees is the biggest promise of chatbots in the long-term. Returning to the hospital example, the chatbot system that was deployed helped to reduce the workload for the hospital’s contact center by 30%, and patients were able to book appointments 24/7 without waiting for operators during peak hours [10].

Current Objectives

Why do people select chat over other services? A 2005 study by Ward [11] found chat services were used by graduates and undergraduates for a variety of reasons:

- a) it was quicker – 48% of responses,
- b) the library was too far away – 16% of responses,
- c) had heard good things about the service – 10% of responses,
- d) did not like asking question in person - 5% of responses,
- e) was the only place to go – 4% of responses, and
- f) other – 15% of responses.

These reasons were independent of the type of question so the author concluded libraries planning to offer chat should expect to “field all types of questions”. Whether or not librarians were positive about the purposed initiative, but definitely the service should be capable to process any type of questions. Thanks to the Internet and its online resources it became to program a chatbot with required functionality [12]. During the last few years, the conversational data counts petabytes of information already and it is not

surprising that chatbots are developing rapidly by having massive training datasets in their arsenal.

There has been a large amount of work for modeling conversations over the past decades. Early studies on this problem adopted rule-based methods to generate responses [13]-[16]. Generally, such conversational agents (which were not called chatbots before) could produce satisfying replies to users by utilizing a pattern matching and substitution methodology based on hand-crafted rules without training data.

Recently, a large number of human conversations accumulated on social media sites motivated researchers to explore data-driven methods of conversation modeling to generate more human-like responses. Work [17] highlights that having social network services like Messenger, WhatsApp, Twitter, Weibo and many others, the data-driven approaches for building chatbots have developed rapidly, showing the specific advantages that are difficult to achieve for the rule-based methods [13], [14], [16]. Nevertheless, all these works are concentrating on the conversation improvement algorithms researches that heavily use neural networks, deep learning and probabilistic methods of conversation quality improvement.

Current work does review of approaches that are used and interaction nuances for certain types of businesses from following aspects:

1. Interaction process for businesses that have stable (to some timeline extend) number of end-point clients, but the “conversation” flow itself is long term (6, 12 or 14 months for instance). For example, the “company” is an apartment leasing office center, where tenants usually stay from 10 to 12 months in average.
2. Interaction process for businesses that have low number of end-point clients for daily communication, but have dynamically changing customer flow. For example, the “company” is a dental office and the appointment recipients during the day is relatively small (scheduling an appointment to visit a doctor or, simply, reschedule it for some other time).
3. Interaction process for businesses that have high intensity of change of customers and agile but short-term “conversation” scenarios. As an example, one can consider as “company” any hotel, where end-point customers are hotel guests (dynamic flow of customers) and they usually stay for several nights.

Current article also researches different aspects of interaction of different businesses with their customers with help of using various communication channels, including social media, social networks, instant messaging systems, advanced web services, etc. In addition, this might be helpful to understand that customized chatbots will become that “golden mean” solutions for them. Comparing strengths and weaknesses that they have in average from “efficient interaction with customers” perspective, eventually companies should come to understanding that the key to successful work nowadays is a smooth transition to partially or fully automated “conversation” systems (aka chatbots).

Modern chatbot concept. Why chatbots are becoming beneficial for businesses.

Couple of years ago, when many social messaging applications, such as Nimbuzz [18], became mass available for usage, the concept of chatbot was introduced. Users were surprised that despite being a bot that was powered by artificial intelligence, interacting with it was quite similar to interacting with a human being. However, before its potential could be fully realized, it was flattened by the incoming waves of search engine marketing and social media marketing. Surprisingly, in the last few years, chatbots have made a comeback and are getting more attention by marketing professionals and business experts [19]. And there comes a question: Why did the need for chatbots become so popularize? Well, there are several reasons for that. Here are several reasons why chatbots are emerging and might be considered as the future for business and marketing.

1. Chatbot application deployment goes very fast

Usually mobile application “design-development-deployment-testing-release” chain takes some time. After the application has been deployed, users are able to download it and start using it. After installation, mobile applications require some initial setup by requesting personal data. Recent years practice shows that this “installation-calibration” period for applications is over and smart phone users are done with them. Even social media apps and social web sites started feeling that people now want their interactions to be more personal and are steadily losing their liking for traditional applications.



Fig. 2. Chatbot vs traditional service mobile application

Smartphone owners became so impatient and lazy that it is just too much hard work and time for them to download mobile application, do this initial setup (inserting personal data), do customization, choose the right options and so on. A chatbot application, on the contrary, promises the kind of privacy and ease people now are asking for. No more clicking on different options and choosing the right tab to click. It is like having a personal secretary who can do everything for you (fig. 2).

2. Chatbots: riding on the back of social networks

During period of 2016-2017 messengers have surpassed social media sites and apps and their users number have been counted more than 300 million. Social media is not something that simple for many people who want to restrict their social interactions to pure and narrow down to one-to-one messages. Even social media wizards feel that there are simply too many groups, too many pages and too many comments to keep track of. Therefore, a switch to simple

messengers gained traction and ended up in the surprising hike in their numbers. The fact that chatbots are riding on the back of these very messengers is enough to explain why they are a better tool to gain new customers and interact with the existing ones. The huge number of users of messengers only make it a more fertile ground for chatbots, an opportunity that has not gone unnoticed by business experts.



Fig. 3. One chatbot system logic can be simultaneously integrated and deployed for Facebook Messenger, regular SMS messaging, Skype, Slack, Telegram, etc.

For instance, Facebook’s Messenger itself has more than 900 million monthly users and it since 2017 started allowing third party chatbots on its platform. Moreover, with proper software platform usage it can become possible to write/design the chatbot logic only once and then integrate and spread the logic across multiple communication channels like Skype, Messenger, Slack, Telegram and others (fig. 3)

3. Personal assistants and secretaries

Chatbots make users feel like they have a personal secretary who can manage their little affairs and chores that despite being boring, are important (fig. 4)

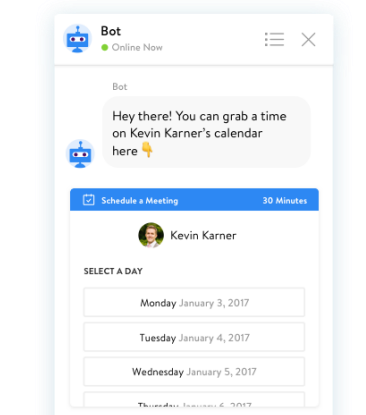


Fig. 4. Scheduling meeting with person through chatbot assistant

Whether it is booking a cab or finding the price of information, chatbots give users a personal touch. They are easy to use and interact with because all the actions and steps are natural, intuitively simple and straightforward.

4. A simple text based interface

Chatbots have a text based interface that can be imbued with a deep learning AI. This makes it a great solution not only for users but also for manufactures. Businesses can now learn more about their customers and customize their

services in a more detailed manner (personalized learning systems). It is evident that AI learning and base knowledge calibration per each customer, with following after that personalization and customization stages will efficiently determine a business's acceptability in the future.

5. Not as expensive as it may seem

As it was mentioned earlier, people do not like waiting and younger generation representatives become more and more impatient when it comes to mobile phone performance and mobile applications efficiency. If a business that company runs involves millions of customers, if company's business has flow of customers that dynamically changes all day over time (hotels and similar businesses where customers can book hotel rooms), or, finally, if interaction with customers can be escalated on several levels, then time plays crucial role and is the main key for successful business and future growth. Aside of the hotels and apartment leasing centers, or hospitals and medical center related businesses, one of the most intensively developing and successful is Amazon with its Lex platform [21]. Amazon Lex is a service for building conversational interfaces into any application using voice and text. Amazon Lex provides the advanced deep learning functionalities of automatic speech recognition (ASR) for converting speech to text, and natural language understanding (NLU) to recognize the intent of the text,

6. Providing uninterrupted 24/7 interaction availability

Chatbots never sleep. In addition to being available 24/7 they are also capable to process millions of conversations simultaneously. When business is on and running, the communication with customers and troubleshooting are one of the most important stages for successful work.

On the example of medical hospitals it is obvious that emergency situation can happen any time, or appointment rescheduling is possible to happen at any moment. For having the process working uninterruptedly an operator should be available all the time, which is why hospitals supposed to have employees available and working by shifting all day. Having an automated chatbot assistant will help to resolve this problem.

In fact companies like "[24]7" (pronounced "twenty four seven") [20] that call their software applications virtual assistants, are already providing similar services to more than 160 different companies including Blue Cross and Blue Shield of Kansas City, Vodafone and others.

- "[24]7.ai Answers" is an automated question and response system that delivers instant answers, drawing from a continually evolving knowledge base. The solution works well for commonly asked questions and can be used to enhance website search and to replace

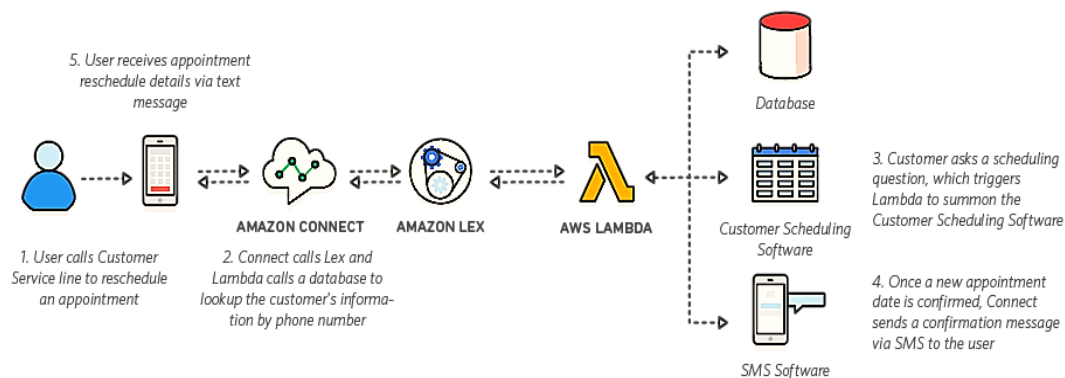


Fig. 5. Amazon Lex chatbot for natural conversations used in Amazon Connect contact center [21]

enabling to build applications with highly engaging user experiences and lifelike conversational interactions (fig. 5). One of the examples where Amazon uses its own product is the AI based implementation for improvement the communication efficiency between customers and company's contact center.

Speech recognition and natural language understanding are some of the most challenging problems to solve in computer science, requiring sophisticated deep learning algorithms to be trained on massive amounts of data and infrastructure. Amazon Lex democratizes these deep learning technologies by putting the power of Amazon Alexa within reach of all developers and, therefore, chatbot creation platform development companies as well. Amazon Lex is a fully managed service and it scales automatically, so customers do not need to worry about managing infrastructure.

Overall, all the practical implementations show that chatbots are instantaneous and significantly improve company's response time and, therefore, improve the interaction speed.

extensive FAQs, which must be frequently updated and are often out of date. System recognizes natural language and can provide accurate answers to questions regardless of phrasing.

- "[24]7 AIVA Assistant" also delivers instant answers to commonly asked questions while using AI to predict consumer intent. AIVA is conversational, human-like, delivers a personalized experience, and can perform more complex transactions. This solution also uses natural language processing and is context-aware, recognizing the consumer's prior history, behavior, and user profile. AIVA Assistant leverages the same Natural Language model as "[24]7 Speech", allowing enterprise customers to build one knowledge base and then expand into Interactive Voice Response (IVR).

7. Not much to lose, but a lot to gain

Chatbots are an opportunity that does not have big risks attached to it. They are more affordable and easy to build and

can generate a huge amount of interest among the customers. Despite the fears of becoming a spam bot, chatbots are more controllable. The type of customization they can help bring by getting information from customers is something that cannot be compared with any other technology that uses such less amount of resources.

Facebook chatbots

Facebook itself is a powerful social platform, which has millions of users who perform different actions and activity. Companies all the time use Facebook and services it provides as a base ground for advertisement and other business development related activity. In the end of 2015 beginning of 2016 some of them (IT based ones) started development and deployment of their own chatbots in Facebook environment (when Facebook officially announced the availability of such services). In the beginning of 2016 Facebook Messenger application already had new bot which was capable to deliver entire flight thread information of certain Facebook user [22]. The Messenger team has announced that its first airline partner's, the KLM Royal Dutch Airlines', bot is up and running in some locations and became more widely available shortly after (fig. 6).

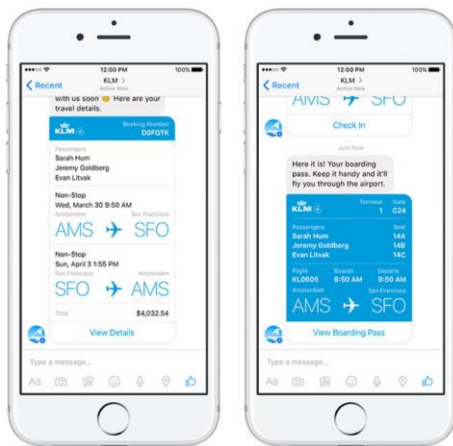


Fig. 6. Chatbot application displays the flight route for the Facebook Messenger user

User have to choose to receive info via Messenger when he/she books tickets through the airline's website to be able to take advantage of its new feature. Once that step is done, the bot will be able to send user's itinerary, boarding pass, check-in confirmation and even delay notifications through the Messenger application. It also gives the choice to talk to a human staff member in case when passenger's have questions way above the bot's pay grade.

In 2016, TechCrunch reported that Facebook gave software developers access to a SDK for Messenger in order to grow an army of useful chatbots. This is likely one of the products of that effort. The disembodied customer service assistants have been a common feature in Asian messaging apps such as WeChat and Line for quite some time now, and their Western counterparts are following suit. Shortly after that, Microsoft announced at the Build 2016 conference that the

latest version of Skype, just like Facebook Messenger, would also be able to run AI chatbots. The existence of bots is nothing new and the most of online sales companies have the bots to assist user while he/she performs shopping activity (for example, assistance with flight ticket reservation or for user's compliance related to bought product). The main difference between bots before and Facebook messenger bots at the moment lies in the fact that Facebook Messenger application is used by more than 900 million of people and with a Facebook bot it is easier to reach lots of people instantly which was not a case with the bots made for a particular customer service [23]. Messenger bots can be used for one-on-one communication or for broadcast messages to all of the subscribed users. Vukovic et al. [23] in their work analyzed different types of bots based on their orientation (business, travel, entertainment, etc.) and introduced a chatbot implementation based on Chatfuel bot creation platform that emulates bank activity (called PseudoBank bot). Although as it was mentioned in the article, main disadvantage is that there is no guarantee for the security of bot's user (fig. 7). If PseudoBank extends the bot with an option for a client to check its account balance, client will have to send some authentication tokens to the bank via bot, such as bank account number and some PIN or password. These data can be intercepted by malicious attacker and used in unwanted way. There is no a hundred percent sure way to distinguish bot from the trusted source, as it is bank, and malicious one, as it is some phishing bot pretending to be a legitimate one.

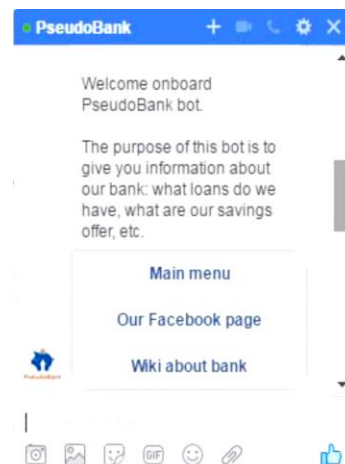


Fig. 7. PseudoBank chatbot in Facebook Messenger environment

So, one of disadvantages related to use of bot business purposes is that bank might lose additional money if there is a phishing bot with similar name that will steal credit card data and cause the bank client a money loss.

Chatbot creation and management platforms review for B2B services

Current review describes and analyses in more details three following chatbot creation platforms: Chatfuel [24], ManyChat [25], and "It's Alive!" [26]. Each one of these

web platforms is based on approach of integration with Facebook environment and will require Facebook account from the person who is going to design the chatbot interaction algorithm and a web page for chatbot binding.

1. Chatfuel

Chatfuel web platform helps users create their own chatbot without the use of the coder on Facebook messenger unlike in traditional approaches where person needs to have certain technical level of education and sometimes programming skills as well. This system was first started in 2015, and the launch was done some time later after the Telegram messaging application was introduced [27].

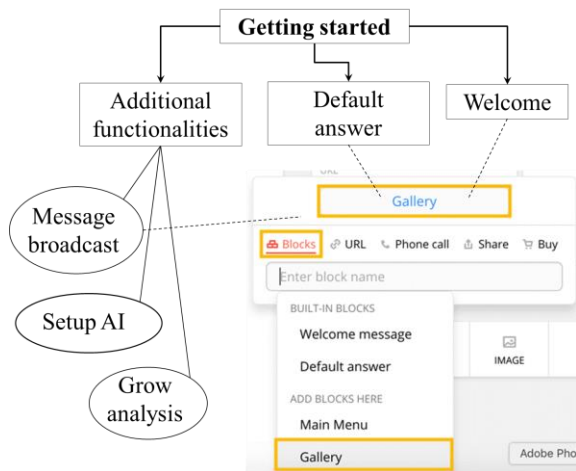


Fig. 8. Base components (nodes) and design functionality for creation of chatbot logic through Chatfuel software platform

Users can create their own topics, post ads, communicate with each other and ask questions through an intelligent AI. Main function of the software API is to establish interaction between machine and user through message and image send/receiving. Algorithm design can be represented as a sequence of following each other message nodes, connected through certain conditional logic (fig. 8). The interaction algorithm creator always begins with “getting started” component (which is called *gallery card*), and move the flow using other nodes such as “default answer”, “bot” and by adding their additional functionalities. All component create using “gallery card” items.

1.1. Gallery cards

Gallery cards are the most basic building component of a bot. They can contain anything starting from a simple text message or image (fig. 9), to other plugins, which allow more complicated actions to perform.

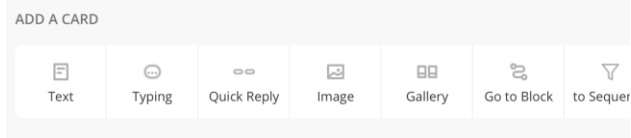


Fig. 9. Display menu for Chatfuel when creating new message node to reply to user’s selected option

1.2. Blocks

Blocks are containers for one or multiple cards. In some sense, they play a role of “logical wrapper” around cards. When a block is triggered, a bot user will receive all the cards, which are contained inside the block. Chatbot designer is able to link different blocks to each other using buttons in text cards, gallery cards, or using plugins like the “Go To Block” plugin. This will create a flow.

By default, there are two blocks that are mandatory, i.e. chatbot designer should create at least two gallery cards (one per each block). These blocks are called “Welcome message” and “Default answer” respectively.

1. **Welcome message** – this block contains all the cards that the bot logic should send for the first time when the conversation with the user starts.
2. **Default answer** – objectively speaking, it is not always possible to cover all the use cases when designing a chatbot interaction logic. Sometimes chatbot might not be able to process the user responses. For that purposes chatbot designer should have at least one card that would be located in this section for the cases when chatbot input information from Facebook user.

1.3. Plugins

There are nine plugins that Chatfuel provides and here will be mentioned only several of them.

1. **Go to block** – this plugin helps to create more flexible and complex bot experience. It helps to create direct connections between cards by doing routing from one card to another based on filter approach. One card asks question and if certain condition (or combination of conditions) is/are met then another card message will be send. This is useful feature if chatbot works with diverse audience, as it can help segment or categorize users and then build separate flows for every group, which makes user experience a lot more personalized. Overall, **Go to Block** routes users between specific or random blocks based on user attributes, which serve as content filters.
2. **User Input** – helps to collect personalized information from the user (preferences, images, files) for further use.
3. **RSS Import** – plugin designed for chatbot integration with given RSS feed channel.
4. **Google Search** – plugin allows showing target content from website that chatbot designer specifies without the need to develop a complete JSON API. Google also crawls websites for new content very regularly, which results in swift updates of your bots content. Overall it is possible to use “Image Title” subpart to define a text to show on the image of the last card, set up the amount of items to show in the gallery, allow users to subscribe to their search results (by using the **Digest** plugin to deliver the feeds, users have subscribed to)
5. **Live Chat** – plugin allows users who interact with deployed chatbot to get in touch with the page administrator where the chatbot is located and integrated with. The plugin’s welcome message and

the final card are customizable. If users start the chat and do not stop it by themselves, Chatfuel will keep the session open for an adjustable timeframe. After the time runs out the chatbot inner service automatically stops the chat session and the AI will continue with next user's input. Each time a user starts a new chat session, page administrator will get push notification from the bot with a link to a Facebook Page's Messaging section where he/she can answer and chat with user (capability for live conversation in real time). To do this chatbot designer person have to connect bot to Facebook Page and click the blue ribbon at the bottom of the plugin to confirm he is the manager of the chatbot.

Chatfuel provides full documentation on all mentioned components. It is located at company's official website, "documentation" section (link reference [28])

2. ManyChat

ManyChat is another chatbot creation platform and management platform that is compatible with Messenger. People who are not familiar with programming or software development concepts can create their own bots with user-friendly interface (fig. 10) that the website provides.

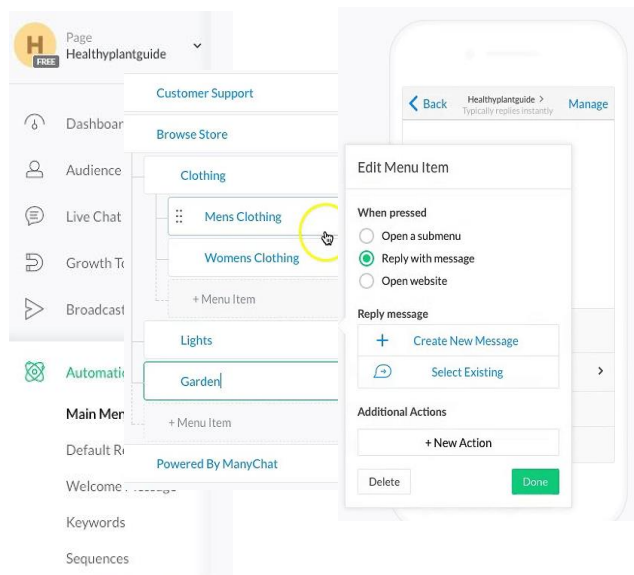


Fig. 10. ManyChat menu displayed when creating new message card

And before algorithm designer will be able to start creating the bot, he or she should bind it beforehand to the Facebook page that will be supported by chatbot later on (fig. 11). The first node to start is with the "Getting Started". This comprises of various other nodes such as "Default Reply", The result chatbot should consist of "welcome" message, "main menu" divided in other subparts, and several other components. System is working similar way to Chatfuel. Chatbot creation website guides chatbot designer through the steps of the initial setup and Facebook web page linking (fig. 11). ManyChat has a free basic plan, which comes with limited features, and the ManyChat's branding in the bot's menu and promotional tools. If chatbot designer signs up for

Pro Plans then website gives access to all features, unlimited tags, custom fields and no ManyChat branding in the menu. Although it is necessary to mention that ManyChat logo will still appear in some promotional growth tools.

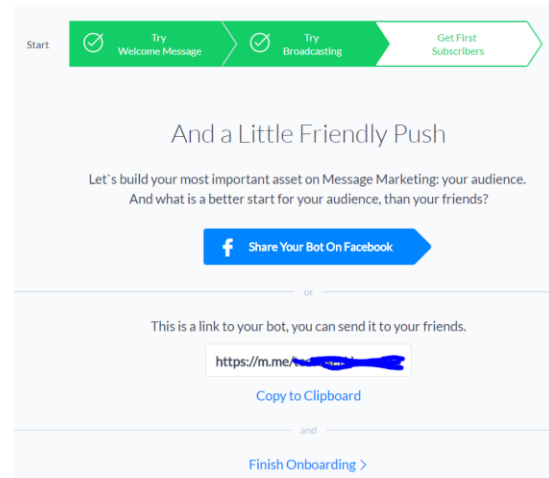


Fig. 11. ManyChat – chatbot initial setup stage. Binding to Facebook page

By default there are also blocks available (as a start point and general item respectively) to work with the chatbot designer environment – "welcome message", "main menu".

1. **Welcome message** – This is the block from which chatbot will start its work. In this module chatbot designer person can start by configuring the very first message that should appear whenever Facebook user connects to the bot. It comprises of following two types:
 - a. **Attached message** – all messages that are connected with each other through buttons called attached messages. Attached message has option of adding picture, plain text, audio recording file, video content, etc.
 - b. **Unattached message** – all messages that can be connected later on to any of the buttons. It has an option of adding picture, text, audio, video or any other file.
2. **Main menu** – this block provides various easy accessible options such as reply with a message, subtitle and URL (where RSS feeds can also be shared)
3. **Additional Functionalities**
 - a. **Live chat** – this feature allows person who has been assigned as chatbot administrator to be able to interact with the Facebook users in real live conversation sessions.
 - b. **Audience** – It gives the ability to see the conversations within the bot especially by providing ability to see internal conversations within the users also.
 - c. **Growth tools** – It gives the ability to see how much users are interacting with the bot means how frequently.
 - d. **Keywords** – In this the individual words can be setup which means whenever user asks

something related to that word it automatically gives the reply with suitable matching word.

- e. **Broadcasting** – It comprises of two features such as regular broadcast which simply gives ability to send message(s) to multiple users at once (bulk messaging) and **auto post** option which means broadcasting of messages from other third party websites such as YouTube.
- f. **Sequences** – with this chatbot designer person message by scheduling sending time.
- g. **Default reply** – user types something that is not defined in the bot and then bot reply automatically with the specific answer provided.

It provides free video training materials related to chatbot creation and proper usage to connect to target audience.

3. It's Alive!

Last chatbot creation and management platform in current review is “It’s Alive!”. System messages are divided into three categories such as **uncategorized**, **essentials** and **recipes**. Chatbot is created using combinations of these three types of messaging blocks. Additionally, “uncategorized” message block has test in it, “essentials” messages block usually is used after “welcome” message, “persistent” menu and “unanswered” type of response handling (fig. 12).

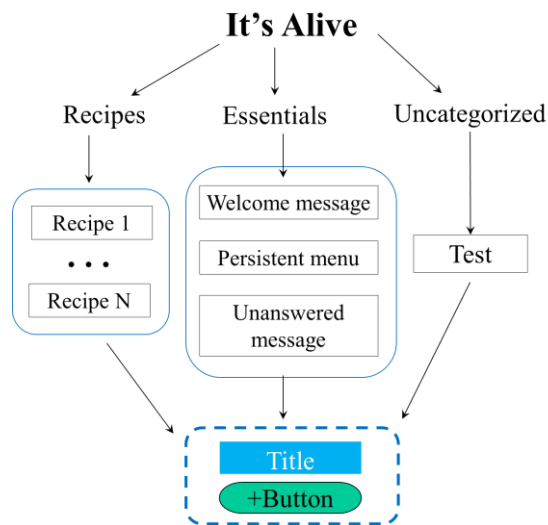


Fig. 12. Chatbot creation logic and components for It’s Alive! platform

So, in most aspects message creation these components provide similar logic of entering title, attaching buttons as it was done with Chatfuel gallery cards. The table below (table 1) contains comparative analysis regarding to pros and cons of using one or another chatbot creation platform, considering such factors as chatbot designer’s programming familiarity level, budget, interaction duration and conversation complexity, desire to include features aside of plain text messaging. Whenever the chatbot designer person will initialize chatbot setup stage, they will be offered to choose a payment plan for chatbot support, one of two options: premium or enterprise (fig. 13 a) and b) respectively).

Choose your plan

	FREE YOUR PLAN	SOLO	PLUS	PRO
Chatbots	1	1	2	5
Monthly Messages	1000	5000	20 000	100 000
No ItsAlive Watermark		✓	✓	✓
Support			✓	✓
	Free	\$19/month	\$49/month	\$99/month

a)

	AGENCIES & MEDIA	ENTERPRISE	CUSTOM
Chatbots	5	10	Custom
Monthly Messages	300 000	600 000	Unlimited
No ItsAlive Watermark	✓	✓	✓
Intercom Support	✓	✓	✓
Direct line Support	✓	✓	✓
One to one training session		✓	✓
One demand features			✓
	\$250/month	\$490/month	Custom

b)

Fig. 13. It’s Alive! Chatbot creation platform. a) Premium plan price sheet, b) Enterprise plan price sheet

Conclusion and Future Work

Chatbots are one of the essential interaction tools between machine and human. Software like that is very helpful in data sharing and content searching based just on a conversation with particular user. As result this might be time saving and more accurate, because system is being calibrated additionally per every user needs. Additionally, system can save the contextual data also such as tracking the location or the phone number for the direct contact. Combined data analysis even more improve the quality of interaction. This work was focused on comparison of capabilities of three Facebook chatbot creation platforms. Deployed chatbots are able to interact with users and send messages through different interaction channels. Article showed that there are several ways and platforms for creating Facebook chatbots. Overall, platforms like Chatfuel, ManyChat and It’s Alive!, provide variety of key features and components. This kind of “human-machine conversation” interaction systems are the future and they significantly reduce the necessity of having additional applications for certain needs and in certain industrial areas. Chatbot systems can easily act as virtual assistants. In the end, all these systems aim to provide a solution to one essential problem – make the interaction with user more efficient, convenient, friendly and natural from interaction perspective.

Table 1. Comparative analysis of strengths and weaknesses of three chatbot systems: Chatfuel, ManyChat and It's Alive!

Chatbot	Chatfuel	ManyChat	It's Alive!
Free plan	Access to almost all the features	Access to limited features	Offers 1000 messages only for sending (singleton)
Paid plan	Depends upon how many users chatbot designer person wants the system to be accessible for. Allows to remove "Powered by Chatfuel" text as well	\$15 monthly payment for the access to all features (the very basic version)	Has options: Solo, Plus, Pro versions starting from \$19, \$49 and \$99 respectively. As the number of messages increases, additional features become available. Offers different plans for Enterprise level too (figures 13 a) and b))
User-friendly environment	Good for coders or engineers to understand easily. Difficult to learn for a random person in comparison to ManyChat	Easy to use for any type of user compared to It's Alive! and Chatfuel	More complex and not so straightforward to start managing and designing from scratch as oppose to Chatfuel and ManyChat
Documentation	Descriptive, not very rich	Good, easy for finding videos as well	No proper documentation
Sequences	Hard to manage, need to build one extra blocks for sequence	Easy to manage compared to the rest ones	Hard to find the specified option (it is under the name of "schedule")
RSS Feeds	Available. Allows to display content from RSS feeds inside chatbot	No RSS feed option is available. As an option of a workaround option chatbot designer can add external links manually	Available. Provides "RSS feed" button feature
Default reply shuffling	Chatbot designer person can shuffle the replies within the bot	No shuffling available	Shuffling is available
Growth Tool	Available. Works similar to the one that ManyChat offers	Available	Not available
AI Setup	Available. Automatically reply to similar sentences or keywords	Not available directly. Chatbot replies only to the keywords that have exact matching	Available. Just necessary to select and bind to link a proper <i>recipe (gallery card)</i> to provide answers with the matching keywords
Tag	Not available	Available	Available
Live Chat Feature	Available since 2018	Available	Not available
Contact Info	Available. Chatbot designer person can add phone number and email for as reply or bind as one of default replies	Available. Chatbot designer person can add phone number, email, image, file as a reply	Available. Chatbot designer person can add URL link as a reply
Templates	Available. System shows different options of building bots in the form of templates	Not available	Not available
Auto saving of chatbot structure during algorithm design	Relatively stable, sometimes glitches can happen	Best auto saving and more stable compared to others	Not stable

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