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FACEBOOK MESSENGER CHATBOTS

How businesses can benefit from this opportunity

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Abstract

This work aims at describing chatbots both from a theoretical and a practical point of view, highlighting the potentialities and opportunities of this technology. In this perspective, the resulting business benefits are defined, accompanied by real-world use cases.

First of all, chatbots are defined and a general overview of the emerging trends is provided. Then, the diffusion status and the raising opportunities are pointed out to make the reader have a global overview of the chatbot domain.

Afterwards, chatbots are analysed from a theoretical point of view, focusing on Artificial Intelligence, Natural Language Processing and the technologies supporting the chatbot implementation.

Further, chatbots are classified into rule-based, intelligent machine and general AI, explaining the main differences between them.

Moreover, after an explanation of the chatbot architecture, the work shifts to a practical perspective to show the main elements required to develop a chatbot.

Indeed, Facebook Messenger channel is analysed in detail since it is the biggest messaging platform supporting chatbots. In fact, its main features, the related opportunities, and some blueprints to acquire new users are illustrated in depth.

Next, the report exhibits a toolkit to develop a chatbot in Facebook Messenger. Thus, the best market solutions are presented for NLP engines and development platforms.

Then, the focus of this part moves to describe the ManyChat platform, that enables a new way of creating chatbots on Messenger without programming knowledge.

Since no code is required, a big obstacle is removed for companies willing to implement a chatbot in their processes. In this context, every type of business is now able to invest in a chatbot to provide better customer service, to strengthen the relationship with its customers or to provide an innovative and interactive user experience.

Finally, several use cases and real-world cases from different industries are illustrated to show how enterprises can adopt a chatbot into their environment and benefit from it.

Sommario

Questo lavoro ha l'obiettivo di descrivere i chatbot sia da un punto di vista teorico che pratico, evidenziando le potenzialità ed opportunità di questa tecnologia. Quindi sono stati definiti anche i conseguenti benefici per le aziende, accompagnandoli con casi reali.

In primo luogo, sono stati definiti i chatbot ed è stata fornita una panoramica generale dei trend emergenti. Successivamente sono stati evidenziati il livello di diffusione e le crescenti opportunità per dare al lettore una visione globale sul mondo dei chatbot.

In seguito, i chatbot sono stati analizzati dal punto di vista teorico, con una messa a fuoco di Intelligenza Artificiale, Natural Language Processing e delle tecnologie a supporto dell'implementazione di un chatbot.

Inoltre, i chatbot sono stati classificati in rule-based, intelligent machine e general AI, con una spiegazione delle loro principali differenze.

Dopo aver illustrato l'architettura di un chatbot, il lavoro si sposta verso una prospettiva più pratica in cui sono mostrati i principali elementi richiesti per sviluppare un chatbot.

A questo punto, è stato analizzato nel dettaglio il canale Facebook Messenger, essendo la più grande piattaforma di messagistica a supportare l'inserimento di un chatbot. Quindi sono state illustrate le principali caratteristiche del canale, le relative opportunità e alcuni template per acquisire nuovi utenti all'interno del chatbot.

Successivamente il report espone un kit degli strumenti utili per sviluppare un chatbot per Facebook Messenger. Perciò sono state presentate le migliori soluzioni offerte dal mercato per i motori di NLP e per le piattaforme di sviluppo.

Dunque, è stata dedicata una parte per descrivere nel dettaglio la piattaforma ManyChat, che permette di creare chatbot per Messenger senza avere conoscenze di programmazione.

Senza la necessità di programmare del codice, le aziende che vogliono implementare un chatbot nei loro processi hanno ora la possibilità di farlo, evitando un grande ostacolo. In questo contesto, ogni tipo di impresa è in grado di investire in un chatbot per offrire un miglior servizio al cliente, per rafforzare la relazione con i clienti oppure per offrire un'esperienza innovativa ed interattiva.

Infine, sono stati presentati diversi casi d'uso e casi reali per vari settori in modo da mostrare come le aziende possono adottare un chatbot nel loro ecosistema e beneficiare della loro introduzione.

Contents

1 Introduction to chatbots

1.1 Definition

"Chatbots are software agents able to perform actions or provide services to a human interlocutor, based on commands or requests received via natural language interaction (written or spoken). The most advanced systems stand out for their ability to understand the tone and context of the dialogue, memorise and reuse the information collected, and demonstrate initiative during the conversation."[1]

Many chatbots rely on artificial intelligence (AI) to simulate human communication. More specifically, intelligent chatbots often rely on machine learning, the computer program capability to improve with experience through the data gathered, as well as natural language processing (NLP), which is when machine learning is applied to simulating human-produced text and language.

The diffusion of services such as WhatsApp, Facebook Messenger, Telegram, Skype and WeChat has undergone such a strong interest in recent years to make chatbots an attractive solution that allows an automatic chat with clients and simulates the human interaction.

Those chatbots may solve tasks that are small or repetitive to a human or they can perform in a faster way some tasks. They do not only answer questions but can analyse the situation and suggest a certain solution that the user may not find on his own.

Usually, these systems are used as an intermediate between the companies and the final client to secure automated support for the product and to explore the contents or as first level contact when customers request help from a company's customer care centre.

In the next sections of the introduction the relevant trends, the diffusion areas and, as well, the business opportunities will be pointed out.

1.2 Trends

Today people communicate on messaging apps and over the past few years, the popularity of these apps has incredibly grown up. The increasing diffusion of mobile devices has pushed the adoption of messaging apps as the first main mean of communication between individuals but also between individuals and enterprises.

Based on a Statista's research made in April 2019, WhatsApp has 1,600 million active users, followed by Facebook Messenger with 1,300 million and WeChat with 1,098 million. But even other minor messaging apps as QQ Mobile, Skype, Snapchat, Viber, Telegram or Instagram Direct, as shown in the following table have anyhow a huge number of active users.

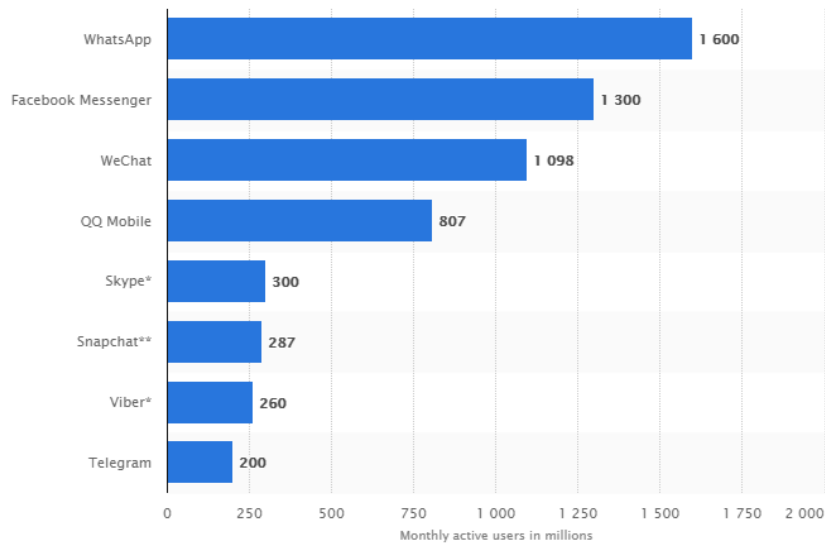[1] Artificial Intelligence Observatory of Politecnico di Milano

Figure 1: Most popular mobile messaging apps worldwide as of April 2019, based on the number of monthly active users (Source: Statista)

Moreover, it is estimated a continuous growth of messaging apps over the next years, considering, in particular, the mobile phone messaging app users:
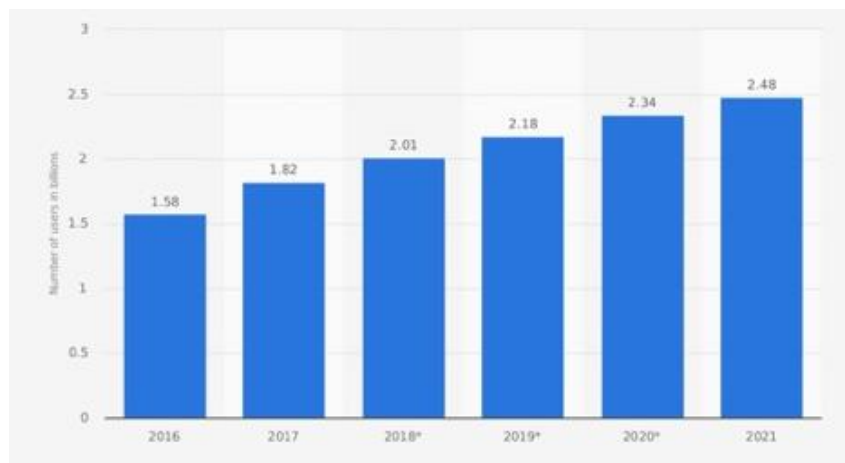

Figure 2: Number of mobile phone messaging app users worldwide from 2016 to 2021 in billions (Source: Statista with eMarketer)

Furthermore, the large majority have started using messaging applications much more than social networks, fact strengthening the importance of this channel.
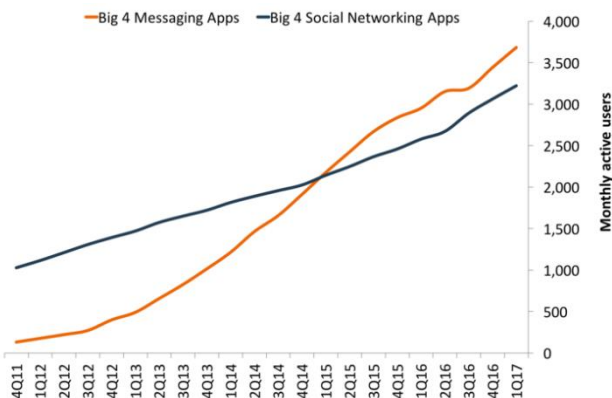

Figure 3: Global monthly active users of the top 4 messaging apps and social networks, in millions (Source: BI Intelligence)

For example, WeChat is the most used app in China, with over 1,000 million active users. Particularly, it is the dominant way people communicate, even at work, instead of using emails.

The app is developed to build a strong relationship between enterprises and customers: once a user follows an Official Account they are making a commitment towards the brand, triggering a "friendship". In fact, brands could send push messages to their fans and they will appear among the list of messages exchanged with all the other contacts.

Indeed, many bloggers and influencers in China use WeChat as their primary channel for distributing content, generating massive readership and interaction with their follower base.

Moreover, WeChat Pay is spread everywhere in China: you can use it to pay for purchases at online and physical stores, request taxis, order movie tickets, reserve a restaurant table, book an appointment with your doctor, and even buy a drink from a vending machine.

Then, it is evident that the Chinese messaging app has become the everyday life assistant and companion of Chinese users.

Furthermore, also the volume of messages sent every day must be considered:

- Apple iMessages: 40 billion messages sent each day;
- Android Messages: 40 billion messages sent each day;
- WhatsApp: 65 billion messages sent each day;
- Facebook Messenger: 20 billion messages sent each month;
- WeChat: 38 billion messages sent per day.

Then, considering that a large part of these messages is sent to businesses, it is evident that chatbots have a very important role in supporting firms in messaging management.

1.3 Diffusion

According to a study by BotCore, chatbots are gaining acceptance amongst users. This has led to organizations integrating chatbots into their operations. Business Insider and Oracle experts predicted that by 2020, 80% of enterprises will use chatbots.

Additionally, a survey conducted by Spiceworks showed that 40% of large companies with more than 500 employees planned to implement one or more intelligent assistants or AI-based chatbots over corporate mobile devices in 2019.
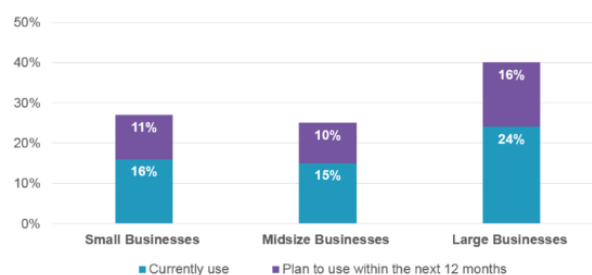

Figure 4: Chatbot adoption by company size (Source: Spiceworks)

On the other hand, 50% of businessmen surveyed by Spiceworks said they did not implement chatbots due to the lack of usage options, 29% due to security and privacy issues, and 25% stated that the high cost of chatbots and intellectual AI assistants keep them from the initial implementation.

Based on the Artificial Intelligence Observatory of Politecnico di Milano research over a sample of 721 firms and 469 AI cases, virtual assistants and chatbots account for the 25% of the total AI solution classes.

As a matter of fact, chatbots have achieved a good maturity level with 40% of companies fully operational, 25% in the implementation phase and 35% with a pilot project or a project idea.

As shown in Figure 5, the sectors in which chatbots are adopted for the majority are Telco (17%), Banking/Finance/Insurance (17%), Automotive (12%), High-Tech (12%) and Retail-Logistics (12%).

In fact, Juniper Research predicted that, by 2022, banks could automate up to 90% of their customer interaction using chatbots.
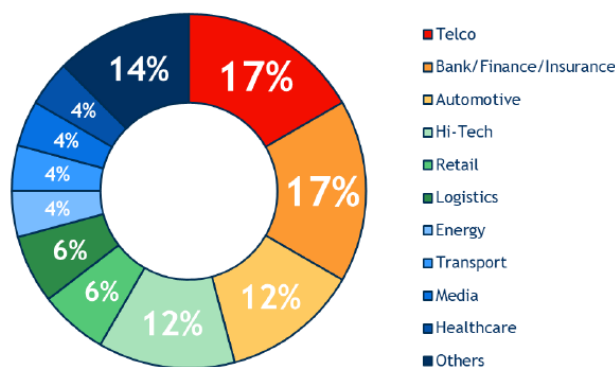

Figure 5: Chatbots adoption by sector (Source: AI Observatory)

Juniper Research also found that the retail sector will gain the most benefits from chatbot technology, estimating that by 2023 over 70% of chatbots accessed will be retail-based.

It implies customer service and eCommerce as key use cases, with benefits in cost savings, upselling, marketing and cart recovery. Indeed, retailers will take advantage of these opportunities, driving e-Commerce transactions via chatbots to reach $112 billion by 2023.

Indeed, the AI Observatory mapping work evidences that 46% of companies are using chatbots and virtual assistants for Service processes, as post-sale customer assistance or to answer questions related the business, and 30% for Marketing and Sales processes, such as guide the purchase process, strengthen the customer experience and increase the brand reputation, shop assistant suggesting products or support sales.
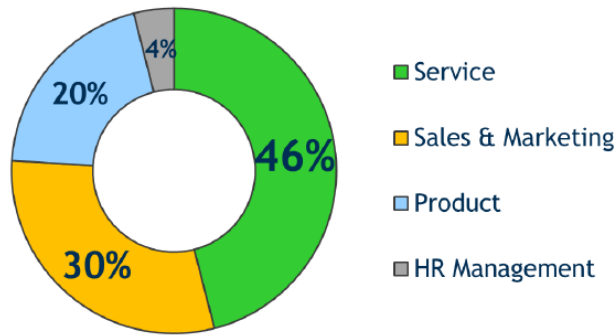
Figure 6: Chatbots adoption by process (Source: AI Observatory)

It is very interesting the Juniper Research finding that businesses can expect to save $11.5 billion by 2023 using chatbots as a replacement for customer service representatives. This will increase from $48.3 million in 2018.

This highlights that firms should consider and exploit the opportunities emerging from this technology to increase their revenues or reduce their operative costs.
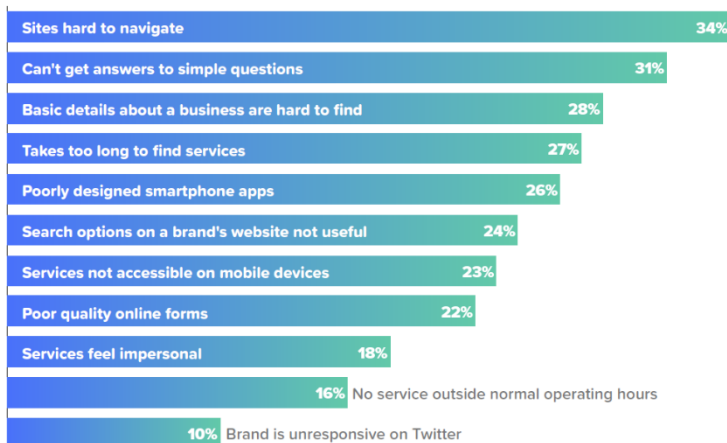
1.4 Opportunities

As it has been explained, chatbots are mostly used in Customer Service and Marketing processes. In fact, when chatbots are used to gather customer insight they provide support 24/7/365 to customers or can support all stages of the marketing funnel.

In fact, chatbots can store information about the questions that the customer asks or other customer's data, respond with the backdated information available and resolve customer's inquiries by reading through a large amount of data in a quick amount of time.

According to IBM, per year 265 Billion customer requests are recorded and businesses spent nearly $1.3 trillion to service these requests. And, chatbots can help them save up to 30% of these costs.

In this context, a research made by the collaboration between Drift, Survey Monkey, Salesforce and Myclever will be used to show how people are buying and communicating with businesses and the related emerging opportunities.

Figure 7: Problems with traditional online experiences (Source: State of chatbots 2018)

Then, starting from asking the sample about the frustrations experienced with online services, the most common answers included websites being hard to navigate (34%), not being able to get answers to simple questions (31%), and basic details about a business (like address, hours of operations, phone number, etc.) being hard to find (28%). It implies that the online experiences businesses are not providing an experience matching the people expectations.

In this perspective, chatbots can enhance the customer experience predicting and providing the information they are looking for quickly and easily. As a matter of fact, 75% of the off-the-shelf chatbot solutions are focused on the Web channel, to support the user navigation on websites.

Furthermore, asking consumers about how they expect to use a chatbot, the most common uses are getting quick answers to questions in an emergency (37%), resolving a complaint or problem (35%), and getting detailed answers or explanations (35%). It is also worth highlighting that 34% of consumers said that they would use chatbots as a way to connect with a human.

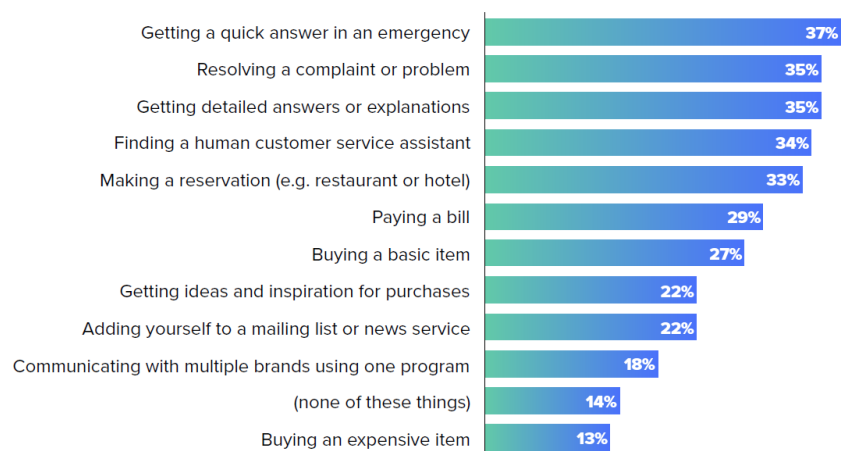*What do you predict you would use a chatbot for?*

Getting a quick answer in an emergency	37%
Resolving a complaint or problem	35%
Getting detailed answers or explanations	35%
Finding a human customer service assistant	34%
Making a reservation (e.g. restaurant or hotel)	33%
Paying a bill	29%
Buying a basic item	27%
Getting ideas and inspiration for purchases	22%
Adding yourself to a mailing list or news service	22%
Communicating with multiple brands using one program	18%
(none of these things)	14%
Buying an expensive item	13%

Figure 8: Predicted use cases for chatbots (Source: State of chatbots report 2018)

It means there is an alignment between consumers' frustrations and their predicted use cases for chatbots. In fact, consumers want to be able to use chatbots to surface information and get answers quickly and easily.

If chatbots were available (and working effectively) for the online services that you use, which of these benefits would you expect to enjoy?

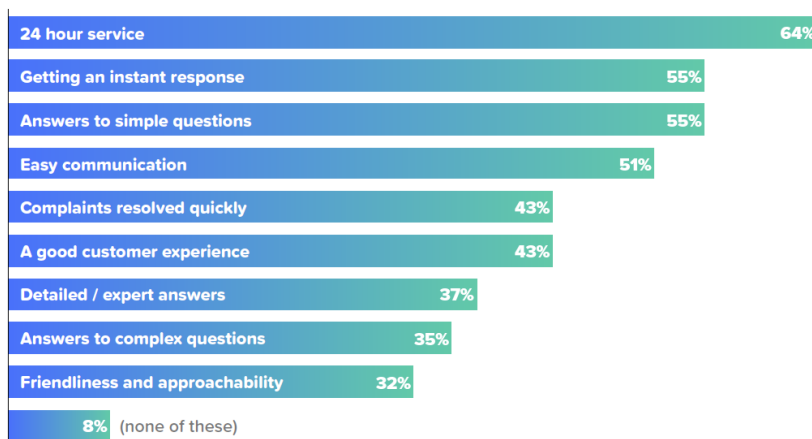|	
24 hour service	64%
Getting an instant response	55%
Answers to simple questions	55%
Easy communication	51%
Complaints resolved quickly	43%
A good customer experience	43%
Detailed / expert answers	37%
Answers to complex questions	35%
Friendliness and approachability	32%
(none of these)	8%

Figure 9: Potential benefits of chatbots (Source: State of chatbots 2018)

But it is really interesting the fact that if the chatbot does not have all the answers, consumers would like to connect directly with a human operator.

Deepening the survey, the most common potential benefit of chatbots that consumers pointed to is the ability to get 24-hour

service (64%). That was followed by getting instant responses to inquiries (55%), and getting answers to simple questions (55%).

Also, the easiness of communication, friendliness, and approachability are relevant benefits sought, confirming that not all consumers are ready to abandon human-to-human interactions entirely, although chatbots are able to create personalized, one-to-one and interacting conversations.

Consequently, businesses, able to communicate with conversational and friendly chatbots and able to switch from automation to human interaction in the right phases of the experience, would benefit the most from the potentialities of this technology.

Therefore, chatbots, for example, should also give the consumer the option to send an email, to call or to talk with a human, to create an omnichannel experience that satisfies all kind of customers.

In a broader perspective, comparing chatbots with other communication channels, like the email, it comes out that open rate and click-through rate metrics are incredibly high.

MailChimp conducted research on millions of emails, and they announced that the average open rate for an email is 20%. That means for every 5 emails you send, 1 person will open it. Chatbots, for example in Facebook Messenger, on the other hand, have open rates that are regularly in the 70%-90% range. Thus, chatbots have 4x higher open rates.

As part of that same research, MailChimp declares that the average CTR for email marketing is 2.4%. That means you have to send over 41 emails just to get 1 single person to click on one. On the contrary, with chatbots, click-through rates reach the 20%-30%. And that is a strong signal that people do not just open these messages, but they read and interact with them.

Thanks to these results, one of the main applications taking momentum is the usage of chatbots for abandoned shopping cart on eCommerce.

Some test to compare email marketing and chatbot marketing confirmed that the second one recovered 1.6x more revenues than the first one.

In fact, chatbots are not able to answer consumer questions regarding products, but they also reach 90% of customers who have abandoned their carts, with 10% of these messages ending in sales conversion.

2 Artificial Intelligence and Conversational AI

2.1 AI definition

"Artificial Intelligence is the branch of computer science that studies the development of hardware and software systems with specific capabilities typical of humans and able to autonomously pursue defined objectives, making decisions that were previously only made by humans."[2]

These specific capabilities typical of humans can be classified into three categories, as shown in Figure 10:

- Input: Natural Language Processing (NLP) and Image processing;
- Processing: Learning, Reasoning, and Planning;
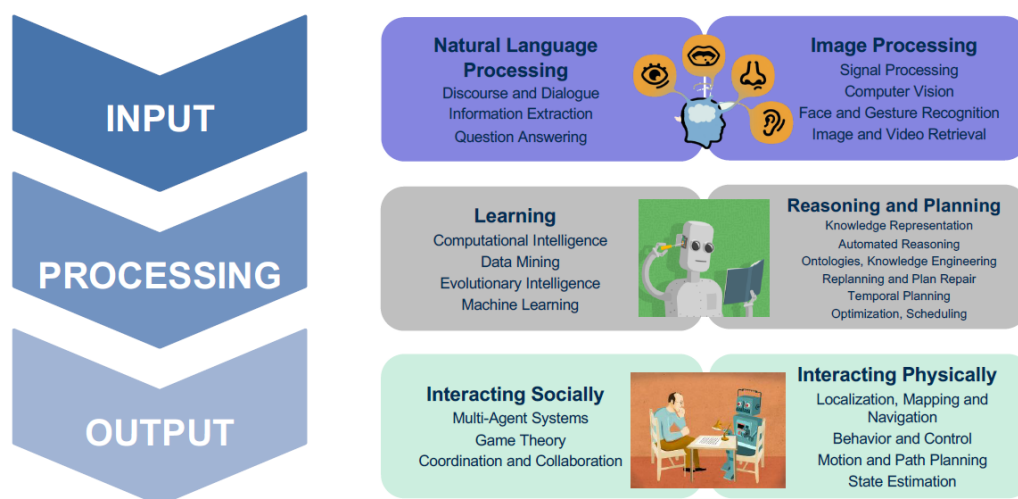- Output: Interacting socially and Interacting physically.

Figure 10: AI capabilities (Source: AI Observatory)

The combination of these capabilities generates different solution classes, as listed below:

- Autonomous vehicle
- Autonomous robot
- Intelligent object
- Virtual assistant/Chatbot
- Recommendation
- Image processing
- Language processing
- Intelligent data processing

The focus of this report will be only in the virtual assistant/chatbot class, which exploits the learning, reasoning and planning capabilities but above all the Natural Language Processing.

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[2] Artificial Intelligence Observatory of Politecnico di Milano

2.2 Natural Language Processing

Natural language processing (NLP) is a branch of artificial intelligence that helps computers understand, interpret and manipulate human language.

NLP combines many disciplines, including computer science and computational linguistics, with the objective to fill the gap between human communication and computer understanding.

Simply, this technology allows users and machines to interact in a natural way. Then, it is a fundamental element for chatbots.

As a result, there has been a direct correlation between the evolution of chatbot platforms and NLP platforms, such as the ones provided by IBM, Google or Microsoft.

Challenges that natural language processing has to face are speech recognition in order to format sounds into text, natural language understanding to comprehend text, and natural language generation to produce the answer.

In particular, Natural language understanding (NLU) is a subfield of NLP that goes beyond the structural understanding of language to interpret intent, resolve context, semantic interpretation and word ambiguity, and even generate a well-formed human language.

The combination of NLP and NLU technologies is becoming increasingly relevant on different software areas and has important implications in understanding the meaning of human language in many contexts.

Moreover, natural language processing performs different techniques for interpreting human language: from statistical and machine learning methods to rules-based and algorithmic approaches.

In general, this technology converts language into shorter and elemental pieces, and tries to understand relationships between the pieces and explore how the pieces work together to create meaning.

Some of the main tasks executed by the NLP are:

- **Content categorization**: a linguistic-based document summary, including search and indexing;
- **Topic discovery and modelling**: accurately captures the meaning and themes in the text, and applies advanced analytics to text, like optimization and forecasting;
- **Contextual extraction**: automatically pulls structured information from text-based sources;
- **Sentiment analysis**: identifies the mood or subjective opinions within large amounts of text;
- **Speech-to-text and text-to-speech conversion**: transforming voice commands into written text, and vice versa;

- **Document summarization**: automatically generating synopses of large bodies of text;
- **Machine translation**: automatic translation of text or speech from one language to another.

These tasks can be performed using NLP platform services, among which the most advanced and used by the chatbot developers' community are:

- IBM Watson Conversation
- Microsoft Language Understanding Intelligence Service
- Wit.ai by Facebook
- Api.ai – Dialogflow by Google

Referring to conversational AI, there are many factors that differentiate chatbots but one of the biggest differences is whether a bot is equipped with an NLP or is not.

In fact, chatbots without NLP rely on buttons and static information to guide the user through the conversation and they are limited in terms of functionalities and user experience than chatbots with NLP.

Besides, NLP potentialities can be exploited according to two different approaches.

The first one is the rule-based approach, that involves the creation and utilization of components exploiting the definition of rules that are triggered once the input is processed. Generally, the process involves the identification of the most important keywords within the user input and their context and subsequently the selection of the appropriate rules based on the keywords. This approach is also called retrieval model since the chatbot answers to the user retrieving a historical answer triggered by the keywords.

The second approach is the intent recognition approach, using techniques to associate a label to the natural language input to understand the intention of the user to complete specific tasks or actions. This approach makes use of a component of NLU to translate the user's input into machine understandable actions. The elements involved in the process are:

- User's natural language input;
- Context: represents the current background of a user's request;
- Intent: represents the purpose of the user's interaction with the chatbot;
- Entity: named variable used for extracting parameter's value from the user input.

To better understand the concepts, let's consider a chatbot providing weather forecast. This chatbot can interpret limited inputs such as "tell me the weather in Milan", "what are the weather forecasts for tomorrow?" or "and for the weekend?". All these inputs are associated by a trained NLU engine to a hypothetical intent called "get weather", representing the intention contained in the sentences above.

Moreover, the engine extrapolates "Milan", "tomorrow" and "weekend" as entities. Once the chatbot receives the intent "get weather" from the NLU engine, it is able to identify the action to carry out (i.e., querying the weather forecast data source using location and dates as parameters).

Summing up, the first approach uses NLP techniques to extract explicit features and leverages on historical data. Instead, the second one uses NLP techniques to extract implicit, learned features to answer word by word to the user, but of course, it needs a bigger training effort.

2.3 AI technologies

Since a broad overview of Artificial Intelligence, its solution classes and a focus on NLP methodology have been outlined, it is possible to define the technologies supporting the development of chatbots.
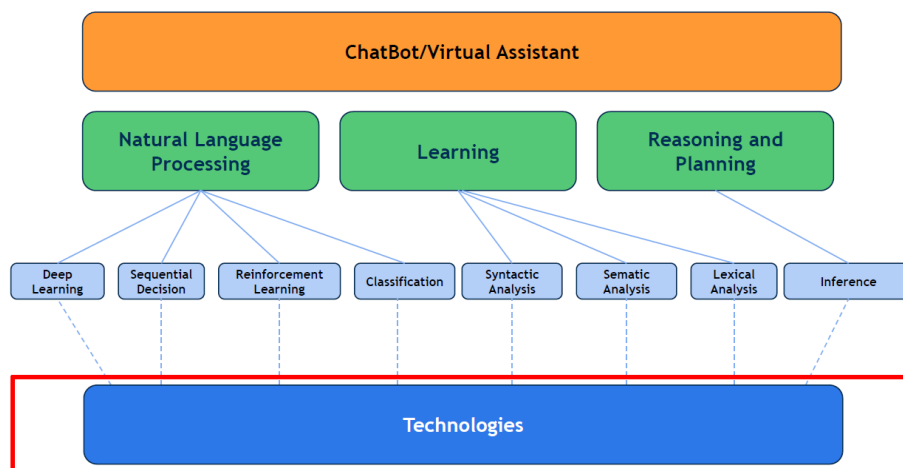

Figure 11: Conversational AI framework (Source: AI Observatory)

First of all, it is essential to highlight the importance of Cloud Computing as technology enabling the development of Artificial Intelligence algorithms, providing the end-to-end platforms needed. Cloud services are accessible from anywhere, at any time and with any kind of device, and they can be rapidly and elastically incremented according to business demand and requirements.

Technologies supporting the development of chatbots and virtual assistants can be classified into three layers:

- **Application**: ready-to-use services with already trained algorithms, that developers can integrate (i.e., IBM Watson, Cortana, etc.);
- **Platform**: platforms that support developers in building and training AI algorithms in a rapid and easy way (i.e., IBM Discovery and Conversation, Google AI, etc.);
- **APIs and Software libraries**: logic architectures around which a software can be built (i.e., IBM NL, Microsoft Cognitive Service, Tensorflow by Google, etc.).

The selection of the technology to adopt depends on different drivers strictly connected to the competences, technology, data owned by the company but also to the business requirements.

In fact, as shown in Figure 12, the main drivers differentiating the technological layers are the

Figure 12: Technological solutions drivers (Source: AI Observatory)

design easiness and the flexibility. The upper solution best fits with companies with lack of competences that prefer to buy a pre-built service. Instead, the lower one best fits with companies with consolidated competences on AI solution development, like multinational corporations.
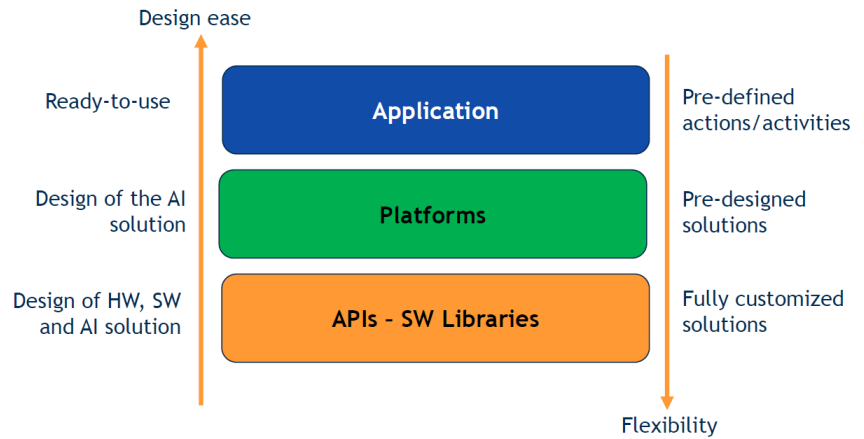
3 Chatbots
3.1 Classification

Chatbots have been connoted with different terminologies such as chatterbots, bots, machine conversation systems, software agents, virtual agents, virtual assistants, intelligent personal assistants, all of those indicating a software agent able to perform actions or provide services to a human interlocutor, based on commands or requests received via natural language interaction (written or spoken).

These terms are associated with chatbots but according to the context and the objective for which they have been built. Indeed, chatbots can perform different roles, such as sell a product, book a service, provide information, resolve a problem, entertain, assist the user in some tasks and so on.

In a broader perspective, chatbots can be classified according to two drivers: their conversation capability and their response mechanism, as shown in Figure 13:
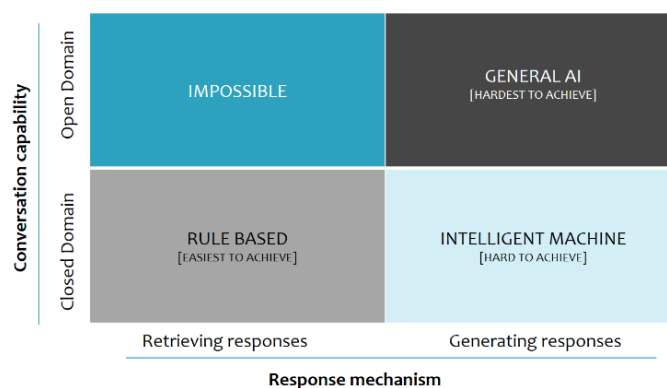

Figure 13: Chatbot classification (Source: Lempinen & Partners)

As it was previously explained, NLP capability can be exploited in retrieving (e.g. from databases) or generating responses.

Regarding the conversation capability, closed domain means that the chatbot is set to a specifically defined topic and the answers will be related to that topic. Instead, open domain means that the chatbot will try to provide meaningful answers instead of a default answer.

As it is clearly noticeable, it is impossible to have chatbots retrieving answers for open domain, since there is no database that contains all the answers for any kind of question.

Rule-based chatbots are chatbots that rely on predefined commands and no NLP or NLU capabilities are included. They are able to provide answers only to predefined commands. These chatbots have the advantage to be simple to implement and there is a low risk to misinterpret the user input since the user is guided along with the conversation.

Intelligent machine chatbots are able to understand a defined domain of user inputs, through NLP techniques. These chatbots are strictly programmed to answer the questions of a specialized domain. From one side they can hold a conversation with the users, but on the other side, they can fall in irrational answers.

General AI chatbots are the ones with the highest level of sophistication since they are not limited in the domain and they are able to answer about multiple subjects and areas of competence.

The most successful business cases have utilized a hybrid model of rule-based and intelligent machine, since they were able to create answers with a lower risk of irrational answers, avoiding scandals like the Microsoft's chatbot Tay.

3.2 Chatbot architecture

In general, the standard chatbots architecture is composed of the following elements, as also shown in Figure 14:

- Datasets;
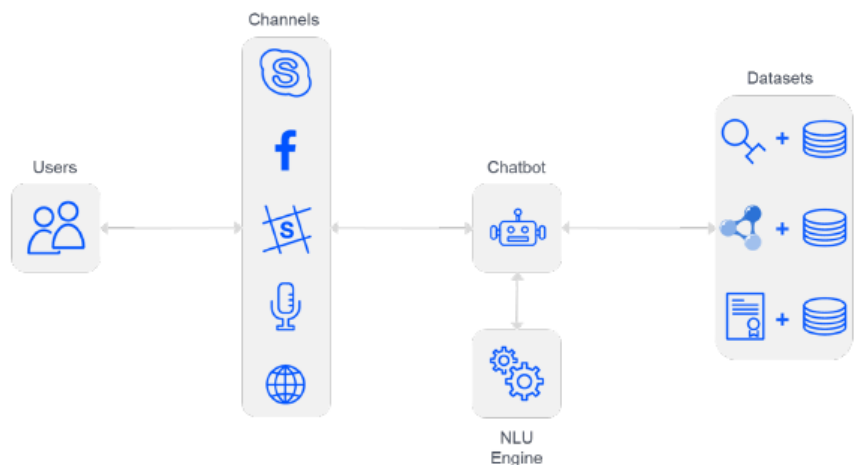- Chatbot application;
- NLU engine;
- Channel.

Of course, the model can be adapted to different situations according to the level of sophistication of the

Figure 14: General architecture of chatbots

chatbot developed. For example, in Figure 15 it is shown the advanced Microsoft chatbot framework.
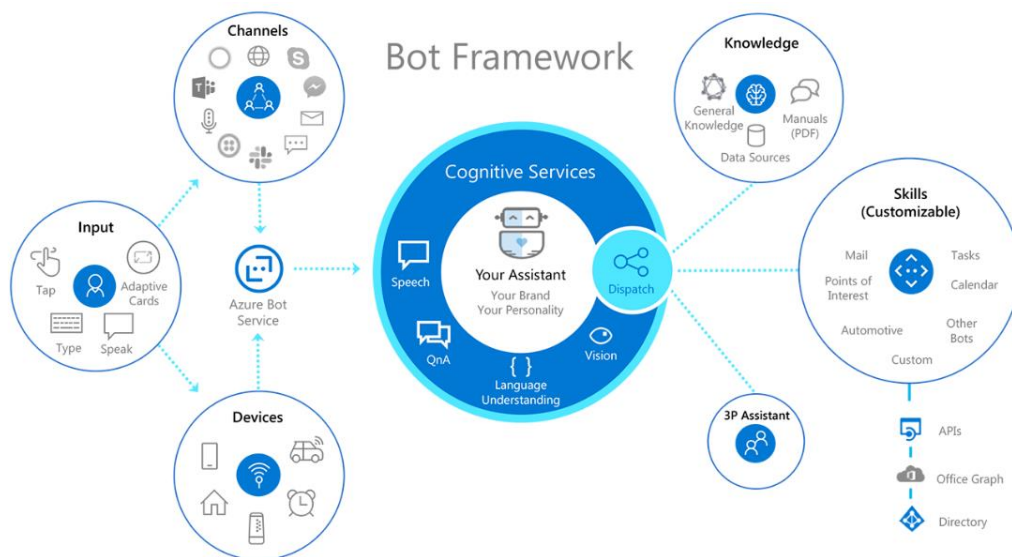

Figure 15: Bot framework by Microsoft

Now, each element of the architecture will be briefly explained.

Datasets

Datasets are external information sources that are accessed by the chatbot application to retrieve information and data requested by the users.

Datasets serve as knowledge bases, that are queried every time users demand to perform an action (e.g., place a reservation) or simply to be informed or notified of some events (e.g., traffic and weather information updates).

Chatbot application

Chatbot application is the core part of the entire architecture. Inputs received by the users through channels are processed by the application and transferred to the NLP component.

In Figure 15, this element is represented by an external component named NLU Engine.

Important data, such as the conversation state and user information, are saved within the chatbot and used, together with the output of NLU engines, to identify the action to be performed.

NLU Engine

NLU Engine is the part of the system processing and it converts natural language inputs into machine-readable data so that it can be consumed by the main chatbot application.

NLU engines today come mostly as external SaaS solutions, to exploit algorithms that are usually complex and time-consuming to implement.

Channels

Channels represent the connectors between the users and the chatbot application.

The main role of this component is to transfer messages containing text, audio, images and other conversational inputs from an interlocutor to the chatbot.

Many chat providers are offering solutions to support and facilitate the integration of their communication channels into chatbots, thanks to the opening of their messaging APIs.

3.3 Chatbot channels

The selection of the platform is one of the key decisions companies must take when they start introducing a chatbot solution. The main drivers guiding the decision are the potentialities that the channel offer, the target using the channel and the diffusion of the platform.

In particular, the following are the channels most used to provide chatbots to end users:

- **Facebook Messenger**: it is the second most used messaging app in the world. APIs were opened in 2016 and more than 300,000 bots were installed till now. This channel will be the object of analysis in the next chapter;
- **WeChat**: it is the most popular messaging app in China, that incorporates a large variety of services besides the messing one;
- **Slack**: it is a software for business communication, that facilitates the collaboration between teams. It can be integrated with a lot of third-party services like Google Drive, Dropbox, Trello, Github, etc.;
- **Kik**: it is a messaging app, mainly used by young people (13 to 19 years old), with more than 20,000 bots installed;
- **Telegram**: very similar to WhatsApp, this messaging app is primarily used for groups chats or diffusion chats. Users can simply chat with chatbots, but can also recall them in group chats and enjoy of a group conversational experience with the bot;
- **Websites**: chatbots on websites pages are taking momentum due to the benefits they can provide on web users, increasing the overall conversion rate.

In a future perspective, opportunities coming from other channels opening their APIs must be considered. In fact, WhatsApp has opened in private beta their APIs and has planned to open publicly in 2019. Moreover, iMessage is planning to launch Business Chat and Android Messages is working on RCS (Rich Communication Services) standard, that could convert SMS into messages with buttons, images, links and more.

In this work, the focus of the analysis will be on Facebook Messenger. In the next chapter, its potentialities and opportunities will be analysed.

4 Facebook Messenger

4.1 Channel overview

Facebook Messenger, or simply Messenger, is a messaging app and platform, developed by Facebook in 2008 as Facebook Chat and subsequently released as a standalone app for iOS and Android in 2011 and over the years Facebook launched a dedicated website interface.

After being separated from the main Facebook app, Messenger had 200 million users in April 2014 but has exponentially grown the subsequent year to 700 million users.

In April 2017 Messenger declared that 1.2 billion users were active in the app and nowadays about 1.3 billion people use Messenger each month.
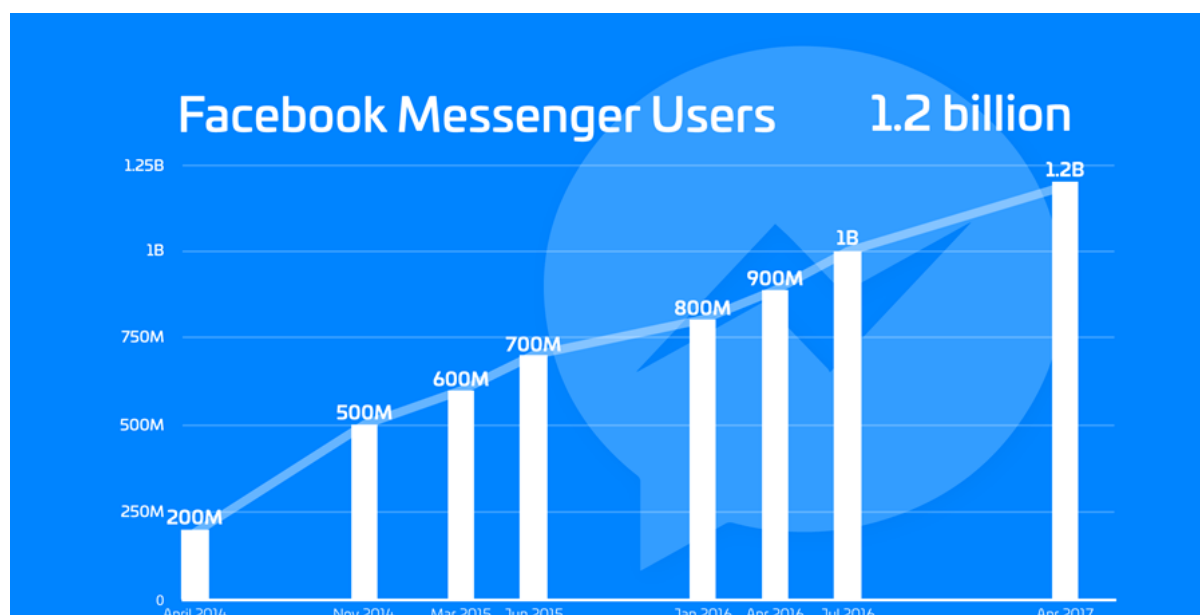

Figure 16: Facebook Messenger growth

The turning point of Messenger was in April 2016, when Facebook announced a bot platform for Messenger, including open APIs to build chatbots to message with users.

After that launch, in only 3 months 10,000 bots were installed and in the first 6 months, 30,000 bots were running in the platform.

The reason behind the success is given by the wide number of features embedded that are continuously increasing and improving, the broad geographical coverage of the service and the compatibility of the devices thanks to a normal and light version of the app.

And, of course, Facebook perfectly managed the exploitation of their 2,38 billion monthly active users.

Today, Facebook Messenger, as shown in Figure 17, has:

- 1.3 billion users each month;
- 20 billion messages sent between people and businesses each month;
- 300,000 developers on the platform;

- 40 million active businesses on Messenger;
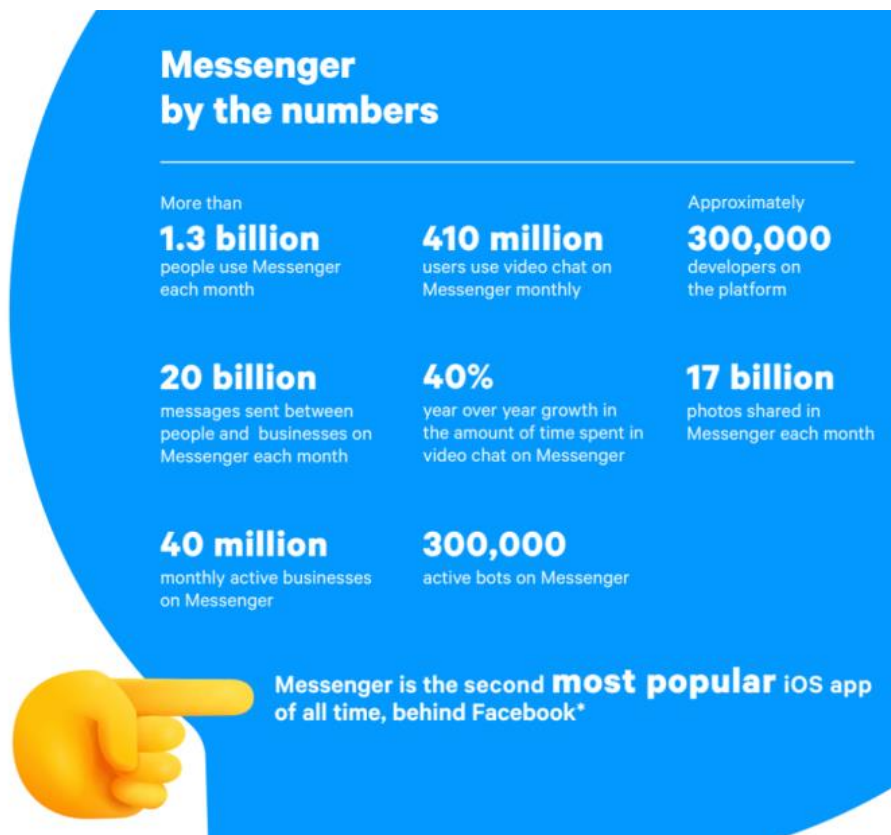- Almost 300,000 active bots.

Figure 17: Facebook Messenger in numbers

Furthermore, the messaging app success is coming by the several features offered to its users. First of all, chats can be started with friends without exchanging telephone numbers and without a Facebook account. Friends can chat individually or in group, but they can also make video calls, using also filters, masks, effects thanks to the exploitation of AR technology.

People, through the app, can send photos, videos, files vocal messages, stickers, reactions, emojis GIFs. In addition, they can share their position or send money, although this last feature till now is available only in the USA, UK, and France.

Moreover, users can play with friends, they can personalize the chat with colours or nicknames, but it is also possible to share stories and find out when your friends are online, or they have read your messages.

Figure 18: Messenger group chat

Figure 19: Facebook Messenger features

To sum up, Facebook Messenger is incorporating the best features of the other Facebook Group's apps, WhatsApp and Instagram. Here, a great opportunity for businesses is emerging since most of the explained features can be exploited also for customer-business chats.
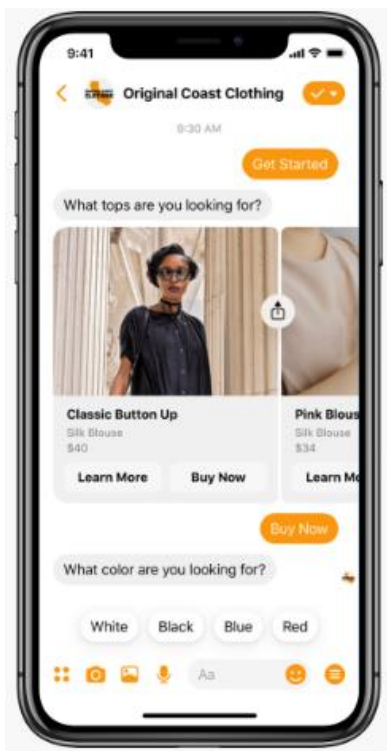

Further, Facebook is continually updating and innovating the app to offer the best users experience. In fact, last April in Facebook's F8 conference for developers, some interesting updates were announced:

▪ Users will be able to communicate directly with WhatsApp and Instagram users within the app;

▪ The apps will be improved with a light and faster version;

▪ All communications will be made end-to-end encrypted by default, to guarantee privacy and security;

▪ Desktop version for Mac and Windows will be released;

▪ Video co-watching, that will allow friends to watch in video calling videos or photos, exchanging reactions.

Figure 20: Messenger customer-business chat

4.2 Potentialities and opportunities

As it has been pointed out, the selection of the platform is a key decision in a chatbot development project.

In this section, all the potentialities and opportunities that can drive to the selection of Messenger will be explained.

First, Facebook Messenger is the second messaging app in the world for number of users, behind WhatsApp. However, WhatsApp has not opened the APIs to build chatbots. Then, Facebook Messenger is the greatest platform on which a chatbot can be built.

Facebook's decision to let third-party applications build chatbots in their Messenger platform has drastically lowered the development costs, thanks to new services and platforms to develop chatbots. In the following chapters, a selection of the main platforms to build chatbots will be shown.

Thanks to the diffusion of the app, the opening of APIs, and new platforms and services built around, the entry barriers to implement a chatbot were cut off.

Furthermore, Facebook is providing an NLP service, called Wit.ai, thanks to the acquisition of the mentioned start-up in 2015.

From a technical perspective, a great advantage of implementing a chatbot on Messenger is the possibility to add a plugin on your website, to help people in the navigation.
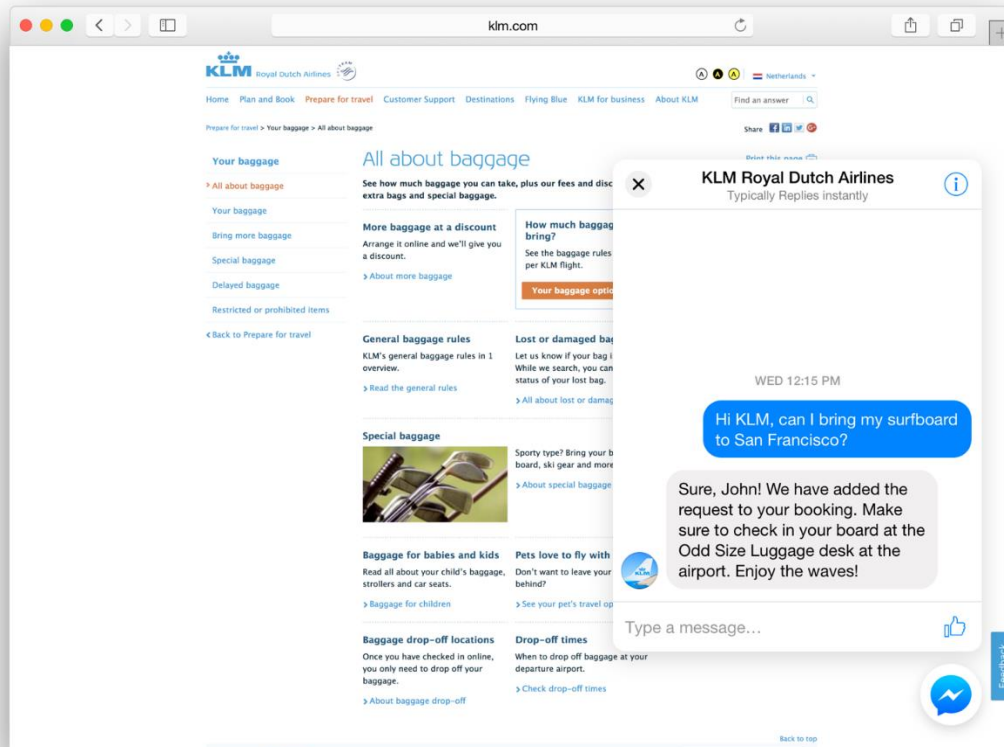

Figure 21: KLM website with the Facebook Messenger plugin

As exhibited in the previous chapters, customers browsing on a website are searching for quick answers to their questions or issues. Then, it is very important to embrace your chatbot on your website.

Moreover, Messenger chatbots can insert a persistent menu below the keyword input, to help people discover and more easily access the bot functionalities for the first-time and returning users.

Figure 22: Persistent menu

Facebook Messenger allows to switch the control of the conversation from the chatbot to a human operator, with a single account. This feature is also supported by the Personas API that creates a virtual persona of the human agent into the thread. It is very useful to make the cust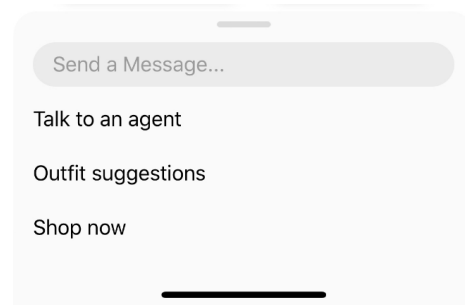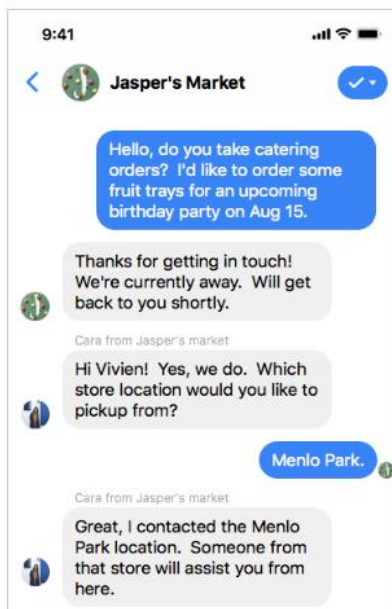omer understand the conversation switched from the "machine" to the human. As it was explained in the introduction section, it is fundamental to make the chatbot pass the control to humans when they are not able to understand or when the user prefers a human interaction.

Figure 23: Personas API

Another potentiality of the platform is the possibility to extract the users' data from Facebook. Data such as ID, first name, last name, profile picture, time zone, gender, language, location, phone number, and email can be extracted once the user opt-ins in the chatbot.

These data can be used for the personalization of the experience or to help the customer care in identifying the user.

Going forward, Facebook also provides the Messenger bot analytics, to help businesses in controlling the audiences subscribed to their chatbot. Also, the number of conversations, the responsiveness, the deleted, marked as spam and blocked conversations can be monitored.

Moreover, all the chatbots can be rated and reviewed by users, to help businesses in improving the service or to block non-compliant bots. In this context, the Discovery section has been created in the app to display the best chatbots.

Furthermore, Messenger chatbots can send different types of messages containing photos, videos, audios, GIFs. Standard messages can be sent, but also a gallery of photos, cards, and carousels. Each message can also be integrated with quick replies and buttons to guide people in the conversation.
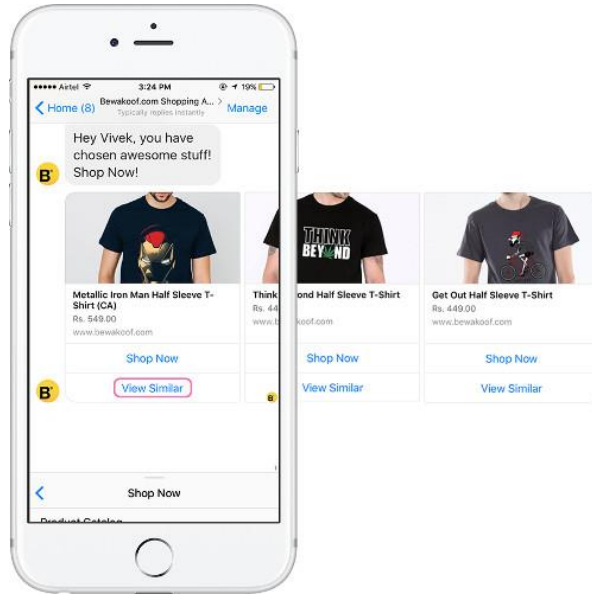
Figure 24: Example of conversation with a carousel message and buttons embedded

In this environment, a payment system can be integrated within the app through the registration of a credit card or using a Stripe account.

In this perspective, the increasing conversational commerce trend can be exploited into Facebook Messenger. Although Messenger Commerce is still in its early stages, the ability to make sales through Messenger should only get more effective over time with future app improvements.
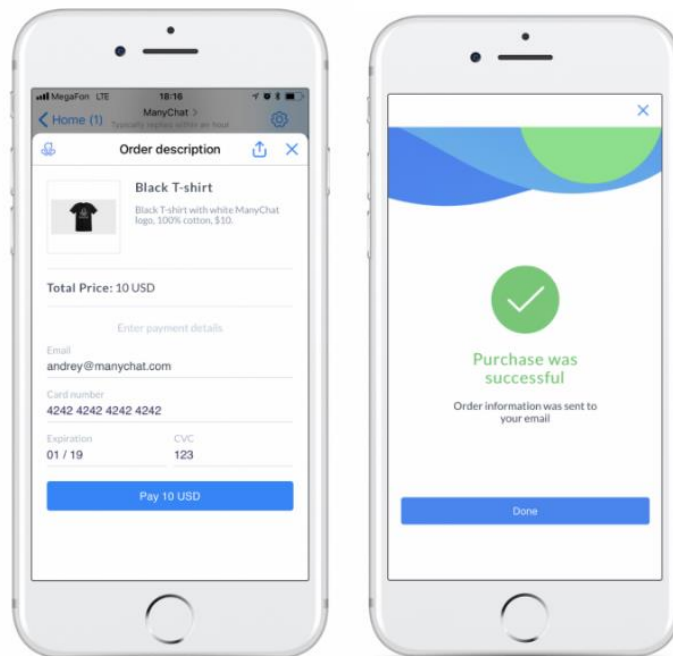

Figure 25: Payment form within a Messenger chatbot

Finally, Messenger is providing several ways to acquire users, that will be explained in the next chapter.

4.3 Users acquisition models

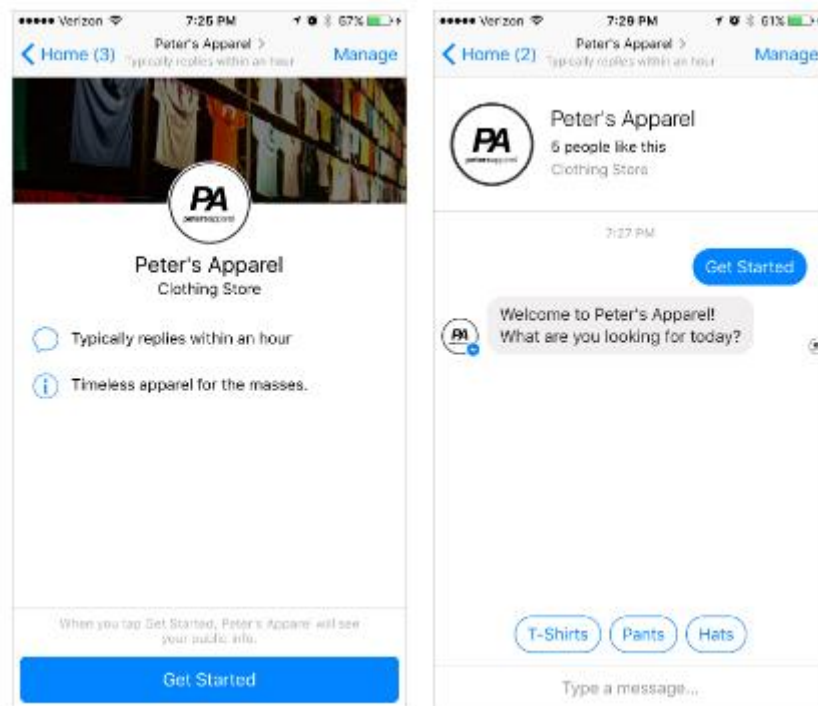Each user landing on a Facebook Messenger chatbot will see a welcome screen as shown in Figure 26:

Figure 26: Chatbot welcome screen

In this screen businesses can add a description of the chatbot, introducing the user to its functionalities, and they can also add a CTA to click on the "Get Started" button.

In fact, to opt-in and start a conversation with the chatbot users must click on that button. Otherwise, they will not be subscribed and will not be able to interact with the bot.

Once the "Get Started" button is clicked, the user will receive a welcome message from the chatbot, and they will be guided through the experience.

Since the user has opted-in, the chatbot is now allowed to extract automatically some user's data:

- ID;
- first name;
- last name;
- profile picture;
- time zone;
- gender;
- language;

But thanks to a Facebook data integration, the chatbot could ask for the location, phone number, and email that will be easily recalled from the private Facebook profile of the user.

At this point, the entry points scenarios for users' acquisition will be explained.

Customer chat plugin

The customer chat plugin is an extremely powerful tool to integrate the Messenger bot in a website. Customers that have already opted-in will see a personalized message from the chatbot, creating a richer and personalized user experience.
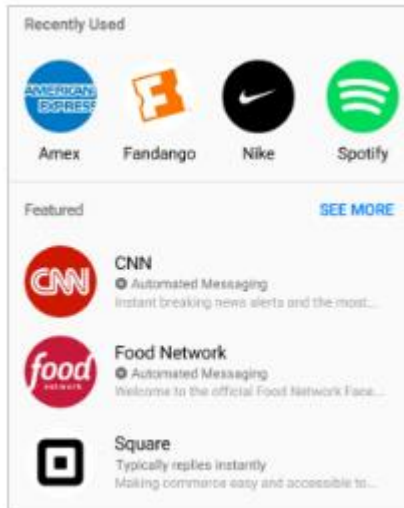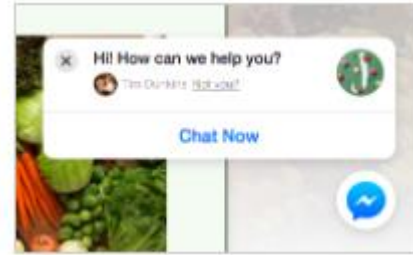
Discover tab

It is a section where people can browse and find businesses to message. Chatbots will the higher number of users and with the best review ranking will be the first displayed.

Search

Users can find a chatbot simply typing the business name in the search box. Businesses already followed by the user will be shown first.
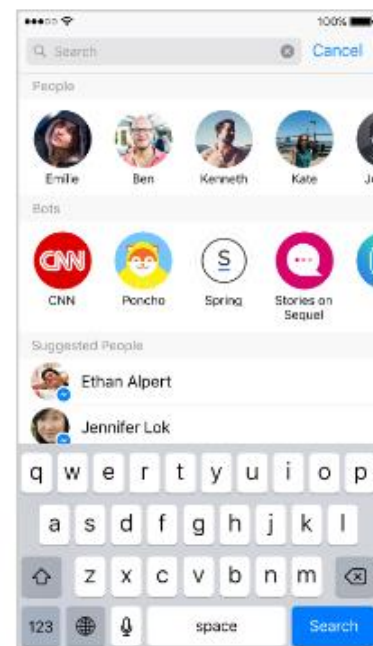
Facebook Page

The easiest way to find a bot is via the Facebook Page. In fact, all chatbots are connected to a page, where it is possible to add the primary CTA "Send Message".

Ads that click to Messenger

Though paid advertising on the Facebook environment it is possible to drive traffic directly to the chatbot.

Web Plug-ins

Messenger provides a variety of plug-ins that can bring users to the chatbot from the web.

The main ones are the "Message Us" and the "Checkbox" plug-ins.

Messenger QR Codes

They can be scanned to instantly link the user to the chatbot. They are very useful to support offline marketing campaigns.

Share button

It is a CTA button that can be added on messages to invite users to join a chatbot conversation.

m.me Links

They are standard links that can drive the user simply to the chatbot or start a specific conversational flow. The general structure of the link is: http://m.me/<PAGE_NAME>?ref=<REF_PARAM> where REF_PARAM is the parameter of the flow to run.

Facebook comments

Messenger allows to manage the comments on Facebook posts, linking the chatbot to defined posts. Once a user comments a post, the chatbot automatically sends a message to start a conversation. This feature is extremely useful when a Facebook Page usually receives a lot of comments, lowering management difficulties.

4.4 Acquisition blueprints

Chatbot introduction requires an investment not only in terms of development and implementation, but to benefit from such investment companies should consider an additional marketing investment to make the customers use the new service.

In this perspective, suitable marketing campaigns should be planned to exploit the introduction of a chatbot.

Then, in this section, some templates explaining how new users can be acquired will be illustrated.

Click to Messenger Ads for Lead Magnet delivery

The objective of this model is to capture new chatbot users by delivering a lead magnet. In marketing, a lead magnet is something you give away for free in order to convince people to opt-in. For example, a PDF, a report, an e-book, audio files, an interview, a research, and similar useful contents are lead magnets.
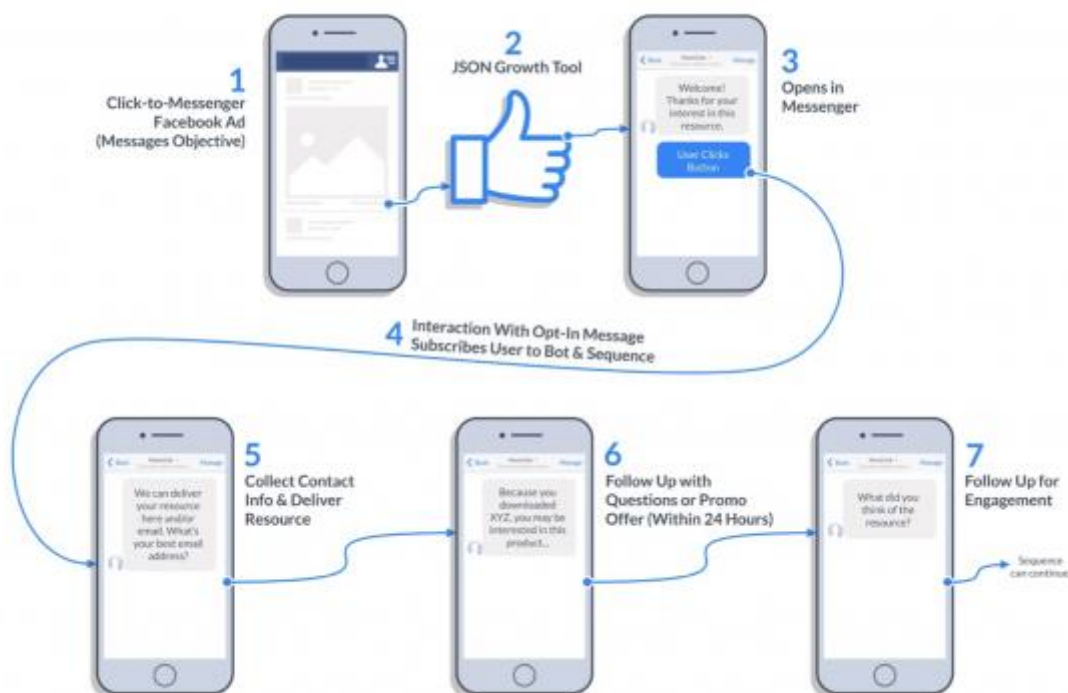

Figure 27: Click to Messenger Ad for lead magnet delivery blueprint (Source: ManyChat)

In this template, the user sees a Facebook Ad, offering a lead magnet, and clicks on it (step 1). Then, thanks to an integration between the Ad and the chatbot through a JSON script, the user opts-in. At this point, the chatbot can ask for a contact (email, telephone, etc.) to deliver the promised lead magnet. Through an integration between the Messenger chatbot and the firm's CRM the lead magnet is delivered (step 5).

In the next steps of the funnel (6 and 7) the chatbot should follow up the user with new contents, questions, interactions to nurture the lead acquired and create a relationship with the potential customer.

m.me link for a free online training

In this model, the chatbot will be exploited to deliver a free online training to the already existing customer base. In fact, through an m.me link of the bot, customer can be driven to a conversational experience with the chatbot.

Leveraging on the enterprise owned contacts (emails, telephone number, social networks, etc.), a communication containing the bot URL will be sent (Step 1). Next, once the customer opts-in, some additional information should be asked to segment the audience (step 4). Then, users will receive a series of messages containing video, materials, photos for the online training (step 5).

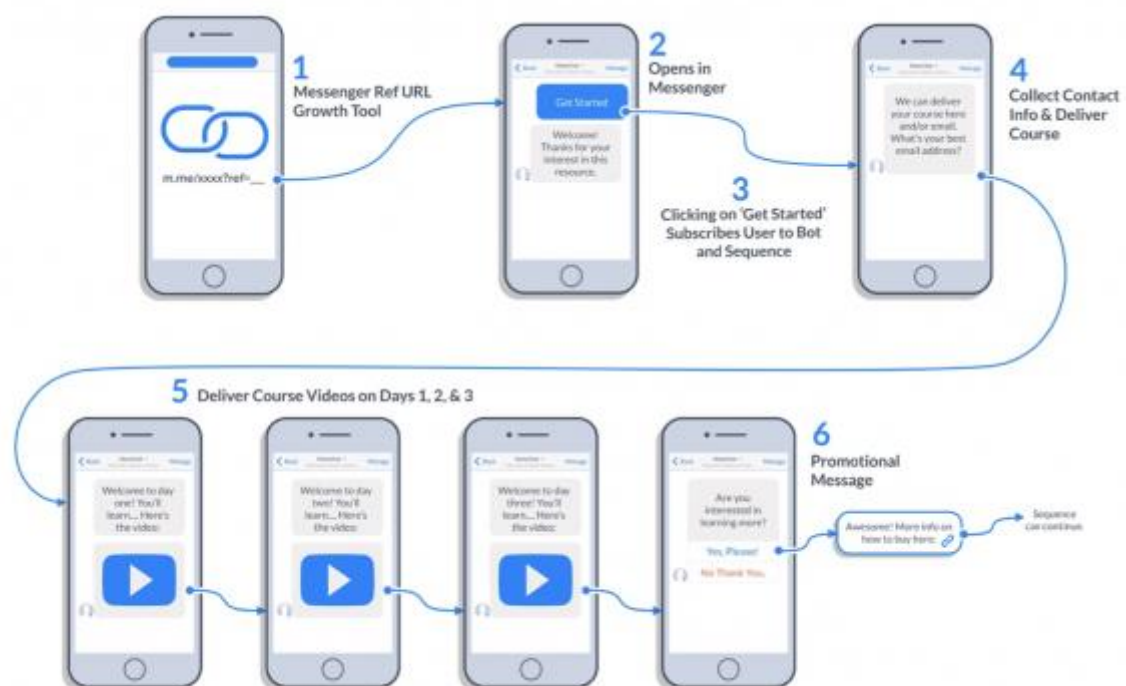Further messages could be sent to engage with the user or to offer some promotions.

Figure 28: Chabot URL for a free online training blueprint (Source: ManyChat)

QR code for an offline marketing campaign

After having analysed two options related to a digital acquisition through paid and organic channels, in Figure 29 it is displayed a simple offline use case to create an omnichannel experience.

The integration between offline and online channels creates a unique customer experience and allows businesses to create a stronger relationship, exploiting different touchpoints.

QR codes can be easily included in fliers, ads, banners, physical signs, and so on. Anyhow, it is important to consider the cultural context on which this model will be applied.

In fact, in some countries, QR codes are not commonly used and in others, like China or the USA, they are part of everyday life.
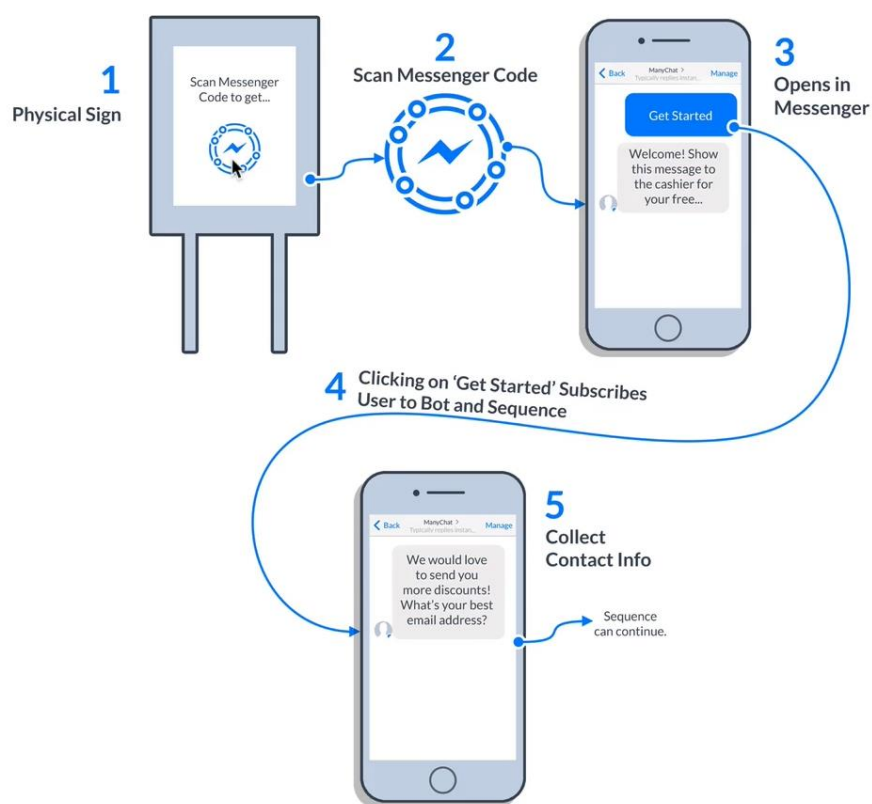

Figure 29: QR code blueprint (Source: ManyChat)

5 Chatbot toolkit

In this chapter, it will be outlined a general overview of the possible instruments developers and non-developers can use to create a Facebook Messenger chatbot. After an analysis of the NLP engines the market is offering, the main chatbot platforms will be explored.

5.1 NLP engines

As explained in the previous chapters, the main NLP engines are provided by four of the biggest digital companies: Facebook, Google, IBM, Microsoft.

More in detail, the NLP services are:

- Api.ai – Dialogflow by Google
- Wit.ai by Facebook
- IBM Watson Conversation
- Microsoft Language Understanding Intelligence Service

All of them offer an advanced and sophisticated technology, but they differ in terms of programming languages, licenses, languages supported and channels in which they can be implemented, as it is displayed in Table 1.

NLP engine	Programming language	License	Language	Channels
Api.ai (Dialogflow)	Android, iOS, HTML, JavaScript, .NET, Python, Ruby, PHP, Java	Free	15+	Facebook, Skype, Spark, Alexa, Cortana, Twitter, voice, text
Wit.ai	Python, Ruby, HTTP, API	Free	50+	Voice, text
IBM Watson Conversation	Java, Python, iOS	Free, standard, premium	English	Voice, image, text
Microsoft NLP	Bot builder SDK	Free, license	30+	Website, APP, Facebook Messenger, voice, text

Table 1: NLP engines comparison

In particular, in terms of costs, all of them offer a free plan, but IBM and Microsoft have different price ranges according to the services provided.

Dialogflow is the one using a wider range of programming languages and, as well as Microsoft NLP, supports the building of a chatbot on Facebook Messenger. Of course, to develop a complete chatbot on Dialogflow or Microsoft NLP specific programming competences are needed. Conversely, as will be explained in the next section, there are other platforms that support the development of a chatbot without programming abilities.

In general, all these NLP engines are essential to convert rule-based chatbots into intelligent machine chatbots and overpass the barrier of simple to advanced bots.

Regarding the selection of the best NLP solution, it depends on business requirements, but Dialogflow seems to be the best solution in terms of cost and quality.

In fact, some big companies like Ticketmaster, KLM, Mercedes-Benz, Giorgio Armani, and Domino's Pizza have built their chatbots with Dialogflow.

5.2 Development platforms

The market is offering a wide range of development platforms, some exclusively focused on Facebook Messenger and others with a multichannel exposure.

The majority allows to build a chatbot without programming competence, cutting off the barriers to adopt a Facebook Messenger bot.

They differ in terms of features provided, such as integrated AI, flow builders, level of customization, native integrations, and so on. These platforms are different also in terms of industry focus and in terms of pricing.

In particular, the market leaders, vertically specialized in Messenger, are:

- ManyChat
- Chatfuel
- Octane AI
- Flow XO
- Mobile Monkey

There are also other competitors like Pandorabots, Gupshup, AgentBot, Smooch, Sequel, Reply.ai, ActiveChat and Botsify that deserve to be mentioned.

In this section, the main platforms will be described from a general point of view.

Afterwards, it will be done a deep analysis of ManyChat, that is the faster-growing platform.

Chatfuel

Chatfuel is a chatbot platform for creating chatbots on Facebook with no coding required. In their website, it is affirmed that 46% of all Messenger bots run on Chatfuel. For sure, with ManyChat, it is one of the most used bot development platforms. Some of the largest companies using Chatfuel are TechCrunch, T-Mobile, LEGO, Coca Cola, Just EAT.

The platform has gathered a community of around 70,000 chatbot developers from all over the world.

It offers the possibility to create a chatbot exploiting almost all the Facebook Messenger APIs, as shown in Figure 30.
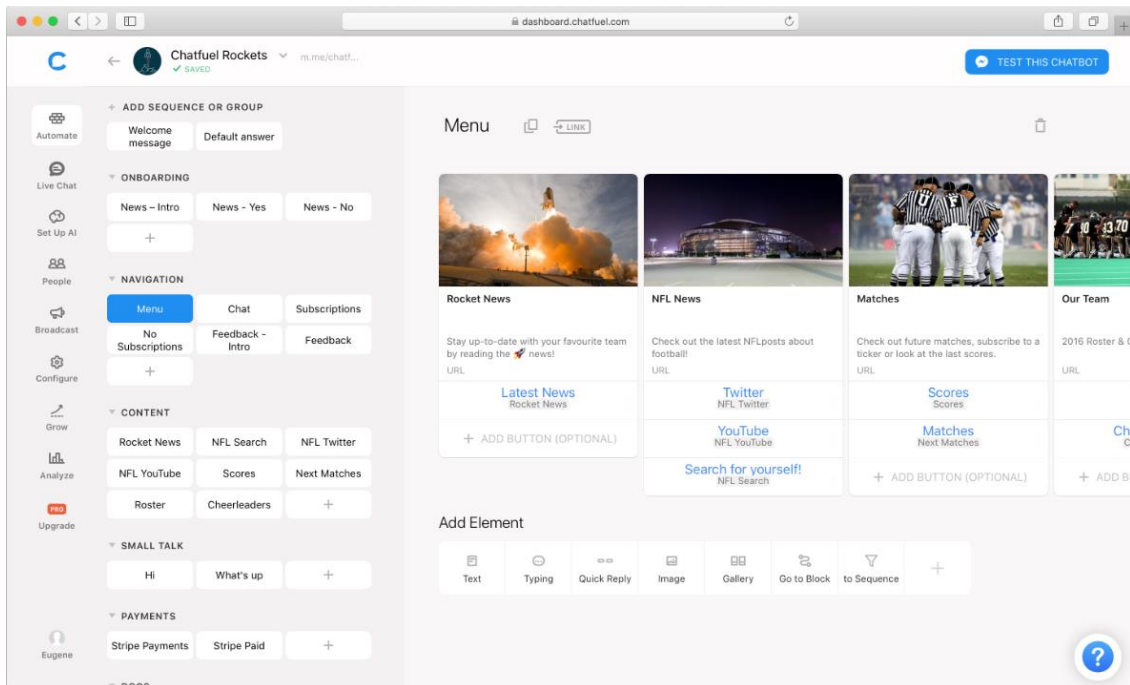

Figure 30: Chatfuel dashboard

The main features are the messages automation, the live chat management, the broadcast sending, and a simple AI setup.

Moreover, enterprises can start to build a chatbot with a free plan or according to the number of users they can upgrade to a Pro ($15/month) or Premium plan ($199/month).

Octane AI

It is a chatbot platform for creating chatbots on Facebook with no coding required, specialized in conversational commerce and e-Commerce cart recovery. As a matter of fact, the platform provides native integrations with e-Commerce tools like Shopify, Privy, Yotpo, Klaviyo, Recharge.

A very interesting feature is the Analytics dashboard, that helps business tracking the revenues generated by the chatbot's conversations.

Plans start from $9/month and go to $999/month, or more, for premium plans, according to the number of users.

Flow XO

Flow XO is a chatbot platform that allows you to quickly and simply build chatbots across a wide range of different sites, applications, and social media platforms.

The peculiarity of this tool is the great number of integrations with external services you can use building the chatbot. More than 100 integrations can be exploited into a chatbot, such as CRMs, Eventbrite, GitHub, Google Suite, Intercom, Trello and many more.

The platform offers a free plan and standard plans, in which you pay according to the number of integrations and interactions that are used.

Mobile Monkey

It is another chatbot platform for creating chatbots on Messenger with no coding required. The service offers a great variety of templates for different types of businesses, that can be easily installed in a few minutes with a few clicks.

Like the other tools, there is a free, pro and premier plan to satisfy the different enterprise needs.

5.3 ManyChat

Founded in 2015, before the Messenger APIs opened in 2016, ManyChat is the platform with the greatest growth among its competitors.

The success of the platform is given by the community built around, with more than 75,000 developers and marketers collaborating and interacting to make the platform always improving. Since Messenger is a channel continuously changing and updating, it is fundamental to exploit the customer base by receiving feedbacks, product suggestions but also sharing knowledge. And ManyChat perfectly worked on listening to its customers and their needs to provide the best service possible.

Moreover, the platform has launched and is launching some initiatives to exploit the community power, such as:

- A Slack work chat for Beta releases, opened to all developers;
- A chatbot building contest to create a template store;
- An Agency Partner Program to qualify chatbot experts;
- A free course training of 13+ hours;
- A conference to bring together developers and marketers from all over the world;
- An Educator Program to encourage the teaching process;
- A revenue sharing program.

All of this led ManyChat to power its chatbots in over 100 countries around the world and to process more than 7 billion messages per month.

Furthermore, in April 2019 the company raised $18 million in Serie A funding and is planning to catch new market opportunities like the WhatsApp APIs opening, the iMessage launch of Business Chat and the RCS standard introduction by Android Messages.

Like the other platforms, it enables the creation of a chatbot on Messenger with no coding required. Differently, from the other services, ManyChat's key selling point is the easiness to use. In fact, the tool offers a visual builder where developers can easily drag and drop the elements to be added into the chatbot flows. In addition, a bot map helps in organizing the logic architecture and the connection between the different flows and elements.

Moreover, its pricing is one of the most competitive in the market, since the Free plan has no users limit and the Pro plan is paid dynamically as the number of users increases. Farther, the Pro plan unlocks all the premium features and the price starts from only $10.

Before going through all the features, it is important to remark that, thanks to the openness of the platform, it is possible to integrate third-party services into the chatbot. In fact, through ManyChat APIs developers can recall external services enriching the user experience. This makes possible to freely customize the chatbot and create solutions ranging from the simplest to the most advanced, for example integrating the best NLP engines.

Finally, ManyChat provides native integrations with HubSpot CRM, MailChimp, ConvertKit and Google Sheets.

5.3.1 Features

Now, an overview of the main features will be outlined to make the reader understand the potentialities of this platform.

First of all, ManyChat allows to install a chatbot to a Facebook Page simply logging in with a Facebook account and clicking on the desired page. Once this step is completed, the developer will see the principal dashboard, as in Figure 31.

In the dashboard, some analytics about the bot subscribers are displayed. In the left bar, the user can navigate through the tool sections, which are:

- Audience
- Live Chat
- Growth Tools
- Broadcasting
- Automation
- Flows
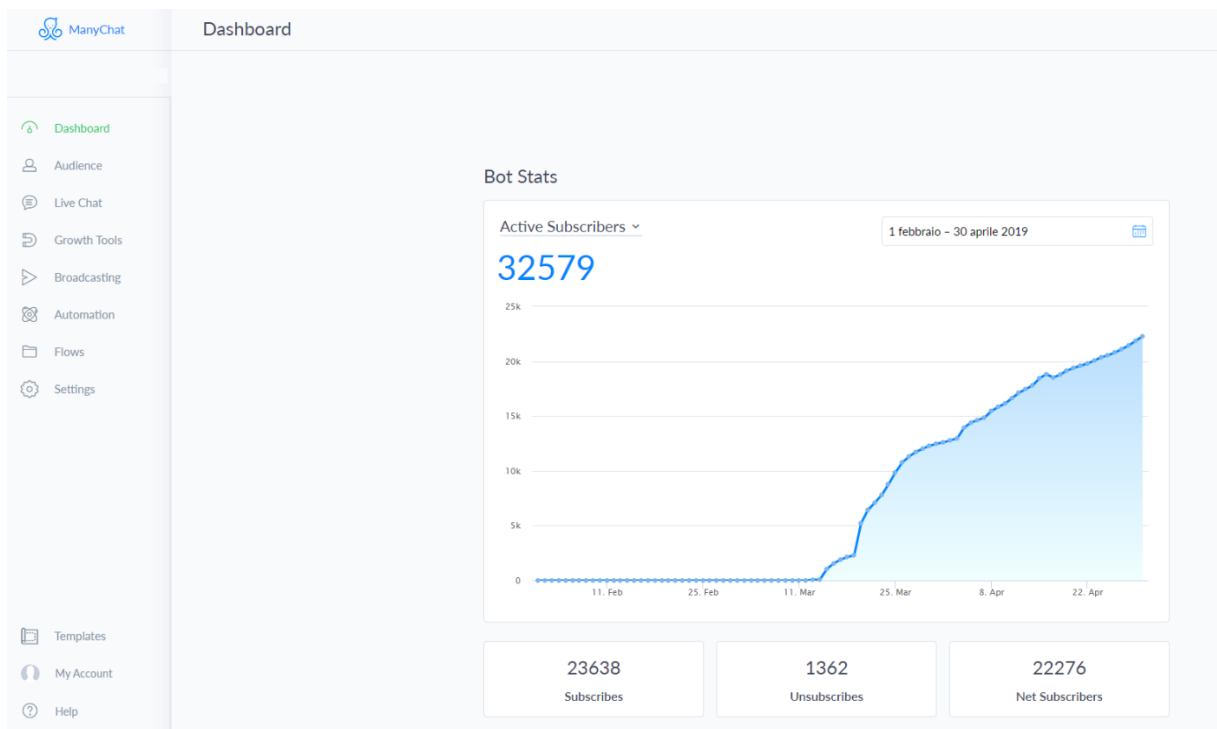- Settings
- Templates/Account/Help

Figure 31: ManyChat dashboard

Audience

In this section it is possible to browse through the entire list of subscribers, searching for specific users using filters such as the name, surname, opt-in method, gender, language, time zone, last interaction, tags applied and many more.
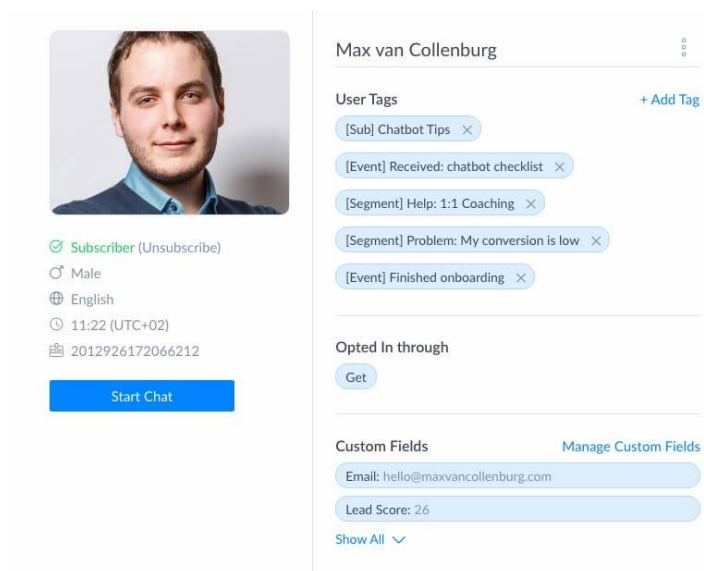

Figure 32: Messenger chatbot user data

In fact, Messenger APIs allow to collect all this data from chatbot users, as shown in the figure below. This is a very powerful instrument since it is possible to segment the audiences and create customized lists.

Moreover, in case the chatbot collects from the user other data, like email address, telephone number, position or other, they will be collected in the Custom Fields division. These features are extremely important, to create a personalized experience because data can be retrieved during the chatbot conversation.

Live Chat

Since it may happen that the chatbot is not able to understand the user's inputs, there is a feature to switch from automation to human control. To help human operators, the section Live Chat shows all the conversations that need an intervention.

As it was previously explained, Messenger allows also to create the operators' personas with their name and profile picture. This option allows to create a more empathic experience. ManyChat incorporated this opportunity, through a simple form in the settings.

Moreover, a powerful feature is the possibility to notify the human operators that a user needs help. In fact, once the conversation is "opened", the operator receives a message from the bot, reducing the time to intervention.

Growth Tools

Through these widgets, it is possible to acquire new subscribers into the chatbot, exploiting the entry points provided by Messenger. In detail:
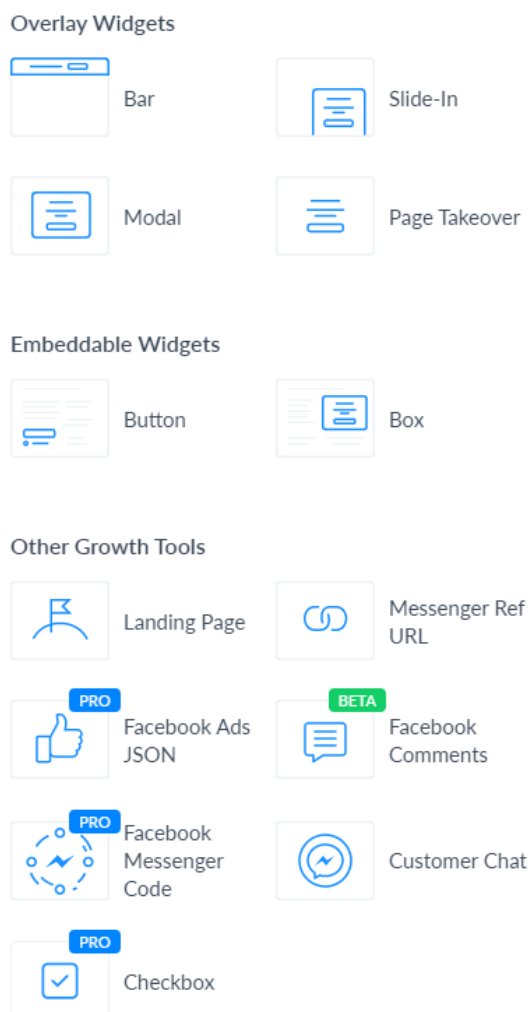

Figure 33: Growth tools list

- **Bar/Slide-in/Modal/Page Takeover**: are pop-up appearing in the website where they are installed;
- **Button/Box**: as well they are embeddable in a website;
- **Landing page**: a customizable landing page with a simple CTA to opt-in;
- **Messenger Ref URL**: a URL with a ref-code that opens you Messenger bot into a specific flow according to the parameters used;
- **Facebook Ads JSON**: connect the chatbot to a Facebook Ad through a JSON script;
- **Facebook Comments**: allows to send a message to users that comment a specific post in the Facebook Page;
- **Facebook Messenger Code**: generate a QR code to be scanned that instantly links to the bot;
- **Checkbox**: embeddable plugin in a website;
- **Customer Chat**: integrates your chatbot into a website.

In addition, a subsection in Growth Tools supports the in-platform creation of Facebook Ads. This feature is natively integrated with Facebook's Ads Platform, avoiding the use of a JSON script to integrate bot and ad.

Broadcasting

With broadcasts you can send a message to all your subscribers or to a segment of them, using targeting filters as explained in audience paragraph. The logical functioning is like sending a newsletter. In fact, you can also decide to send the message now or to schedule it for later. Additionally, you can send it according to the different users' time zones.

This feature is extremely powerful because users are notified with a push notification, and a floating bubble of the sender will show up in the device screen.

Furthermore, the average Open Rate is about 70%-90% against the 20% of emails. And also, the CTR ranges between at least 20%-30% against the 2.4% of emails.

Figure 34: Message bubble notification

Automation

This section includes one of the core parts of the Messenger chatbot development. In fact, here it is possible to set up the:

- **Main Menu**: the persistent menu;
- **Default Reply**: the message that the user receives if the chatbot cannot understand the user input. Here, to create a smarter chatbot, an NLP engine should be integrated through APIs;
- **Welcome Message**: the message each user receives after the first opt-in. In this message the chatbot introduces itself and guides people along the journey;
- **Keywords**: here, it is possible to create a sort of simple NLP. Indeed, if a user's message is equal to/contains/begins with a keyword, the related answer is triggered;
- **Sequences**: series of messages sent to follow up the conversation or to nurture the relationship through valuable content;
- **Rules**: list of rules that are triggered when some events happen. Once the user performs some actions, in turn, the chatbot adapts performing some actions as well. For example, if the user sends a contact, the chatbot can send it to the integrated CRM or add it to Google Sheets.

Flows

Here there is the heart of chatbot development. It is possible to browse the list of conversational flows, organize them into folders and create new ones.

Moreover, through the Bot Map feature, it is possible to organize the chatbot's logical architecture of flows, as in Figure 35.
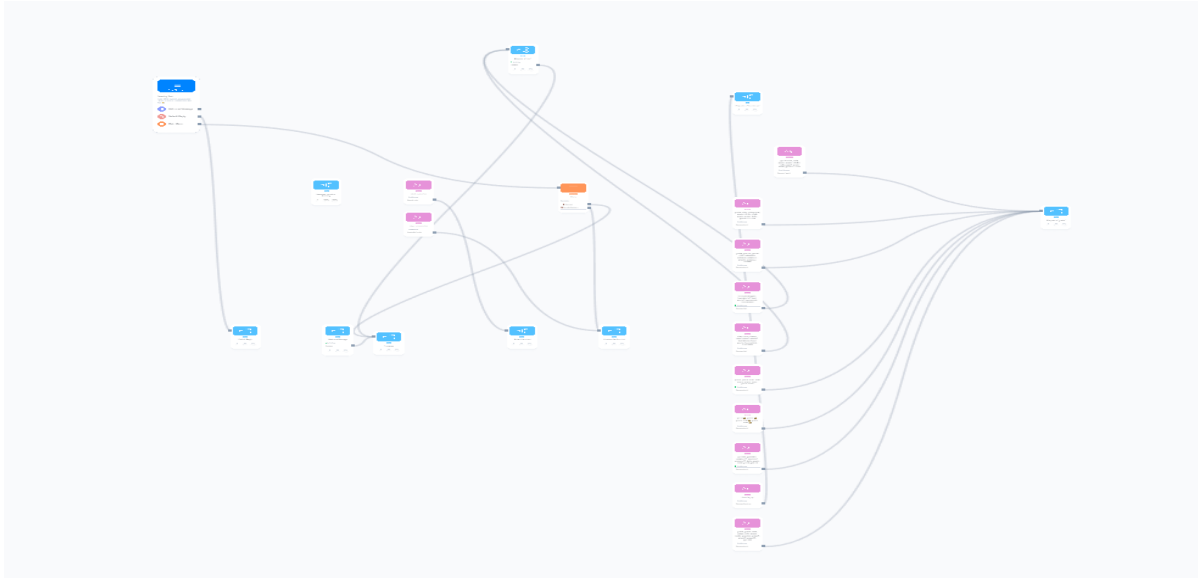

Figure 35: ManyChat Bot Map feature

In this context, as it has been explained, the key strength of the tool is the easiness of use, thanks to the visual builder feature to create a conversational flow.

Simply dragging and dropping the different elements, you can create a conversational flow that will be performed by the Messenger chatbot once it is triggered.
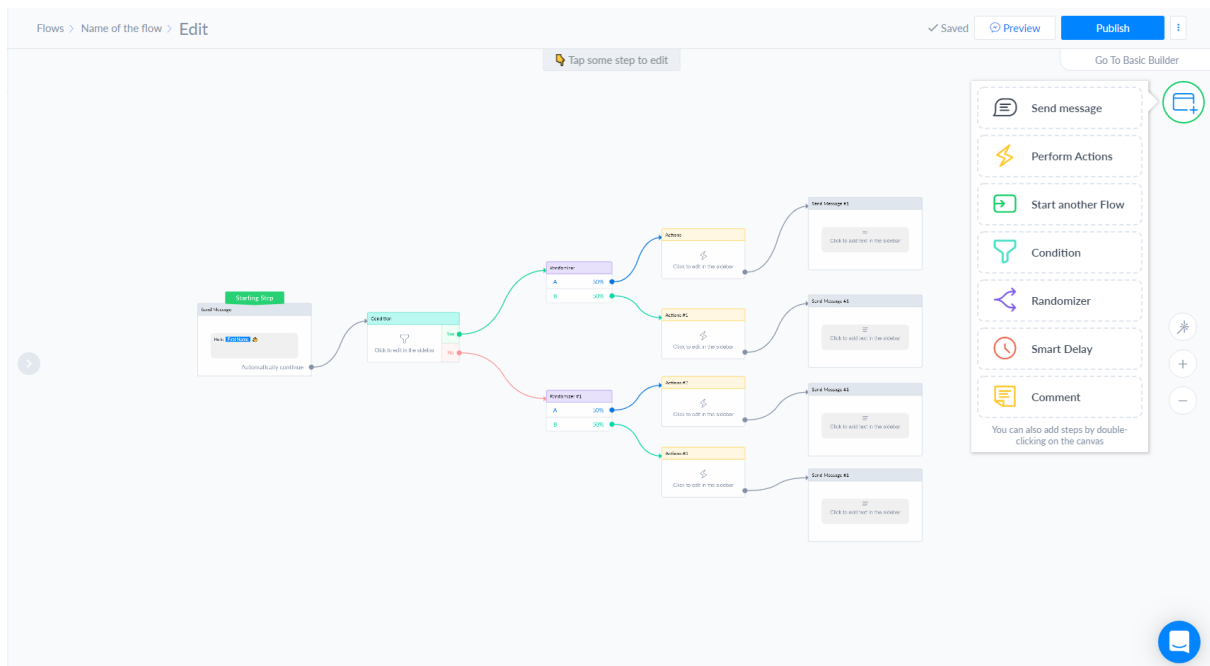

Figure 36: ManyChat visual flow builder

As shown in Figure 36, seven different elements can be used in the flow creation. The first and main one is the "Send Message" element. The developer can compose the message inserting text, images, GIFs, audios, videos or files.
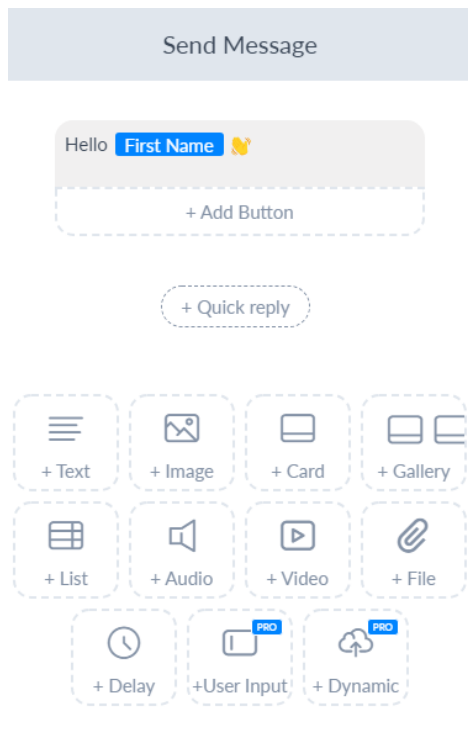
In addition, media content can be delivered in form of cards, galleries or lists.

The developer can also add delays to simulate the chatbot typing between one message and the other, making the experience more realistic.

In particular, the most powerful features are:

Figure 37: Send Message feature

▪ **User Input**: asks the user to type or send a custom datum, like email, phone number, date & time, location, media content or simple text/numbers. These data will be saved in the user's profile and can be retrieved every time is needed by the chatbot.

▪ **Dynamic content**: recalls through APIs external content and sends it with a message. For example, it is possible to send the last website's articles or recall users' data stored in proprietary databases of the enterprise.

Finally, each message can integrate two types of buttons to guide the user in the interaction:

- **Standard buttons**: fixed buttons attached to the message;
- **Quick replies**: up to 10 floating buttons below the message. Once the user clicks on one of them, the others disappear and the conversation continues according to the one selected.

Briefly, the other elements that can be implemented in a flow are:

- **Perform Action**: the chatbot performs in background some actions, such as adding a tag to segment the audience, notify admins if needed, saving a datum into the user's profile, call external services through APIs or exploits the native integrations with HubSpot CRM, MailChimp, Google Sheets, ConvertKit;
- **Start another Flow**: the flow ends and another one starts;
- **Condition**: according to the matched condition, one of two paths is performed;
- **Randomizer**: creates up to 6 different steps and the traffic is split among them. It is very useful to create A/B tests and increase the chatbot performances;
- **Smart Delay**: the chatbot stops for the established time and then continues to work;
- **Comment**: create notes for the development team, to support the coordination of the work.

In conclusion, ManyChat is a complete chatbot platform exploiting all the Facebook Messenger opportunities. Leveraging on the community, the platform evolved from a simple chatbot development platform to an advanced tool, satisfying the developers' needs.

Moreover, the platform is a great opportunity also for marketers or small business, since no coding knowledge is required to build a good performing chatbot. Through this tool, businesses can automate some processes, create a better digital experience and gather useful insight by leveraging the data collected.

Unfortunately, ManyChat is limited by the absence of a native NLP engine. Although, it is easily integrable through APIs with Dialogflow, Wit.ai or other engines.

As a result, excluding companies in search of an NLP driven bot or a custom and industry-specific solution, ManyChat is one of the market leaders thanks to its offering.

In fact, whether a small business or an SME or a multinational enterprise, a good performing chatbot can be implemented with a small investment and without specific programming competences.

6 Use cases

In this section, some use cases from different industries will be illustrated. As shown in the Figure below, a lot of big brands are investing in chatbots and messaging innovation.

Figure 38: 100 top chatbots for brands (Source: Topbots)

Moreover, the majority of these brands, such as Sephora, Unilever, Disney, Tommy Hilfiger, PayPal, Pizza Hut, Wall Street Journal, BBC, eBay, Skyscanner and many more, has implemented a chatbot in Facebook Messenger.

As it is understandable, chatbots have no industry limit and their potentialities can be exploited in innovative ways to enforce the customer relationship.

In this perspective, several use cases are outlined for the main industries.

6.1 Beauty

A chatbot can guide the user in browsing the different beauty products, provide make-up advice, tutorials, tips, and tricks, but can let you book an in-person appointment with a professional.

In addition, integrating the chatbot with AR technology it is possible to virtually test beauty products through a video camera.

Sephora's chatbot is one of the best-case studies since they used this instrument to book a make-up session in their physical USA stores, increasing the booking rate by 11%.

Furthermore, this action increased the visits to the stores and helped the brand in improving the service through post-treatment feedbacks. In fact, since the booking date and time was saved in the user's profile, the chatbot was able to follow up customers with an in-chatbot simple survey.

Besides, with further automated messages it is possible to increase the customer retention sending promotions, offers, tutorials, tips, event invitations and many more.

Similarly, the same actions can be applied to a local beauty salon, with the same potential benefits.

6.2 Consumer goods

Chatbots are used to engage with fans that are already consumers or to personalize product recommendations and suggest related recipes. For example, Unilever developed a chatbot to help parents teach their children healthy brushing habits, as shown here below.
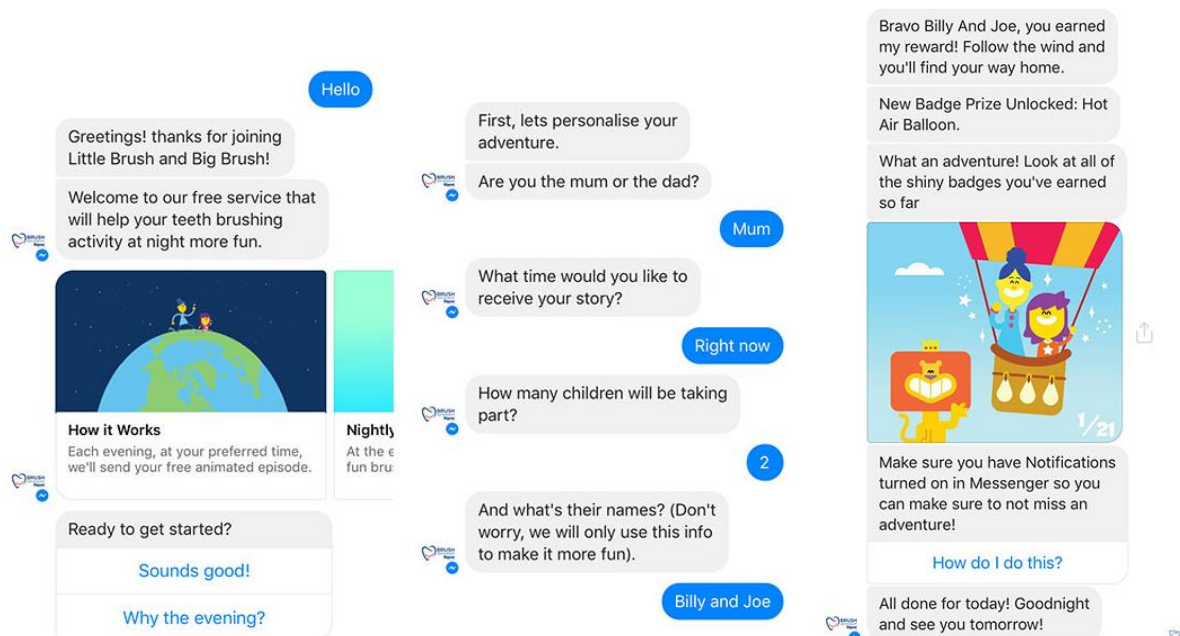

Figure 39: Unilever's chatbot example

Thanks to an interactive experience, enriched with animation, storytelling, gamification, badges and social routines for the family, Unilever was able to strengthen its brand and the relationship with its customers.

6.3 Entertainment

Bots are an incredible way to get engagement and hype around the launch of new games or movies. Instead, for ticket portals, like Ticketmaster chatbots are a good opportunity to smooth the customer experience steps while searching for a show or event.

For example, LEGO created a chatbot, using Chatfuel and Dialogflow, to offer people gift suggestions. They reached a 3.4x online sales increase, leveraging on a personal shopper for toys, which has a friendly personality stressing the creativity and sense of fun LEGO toys have.
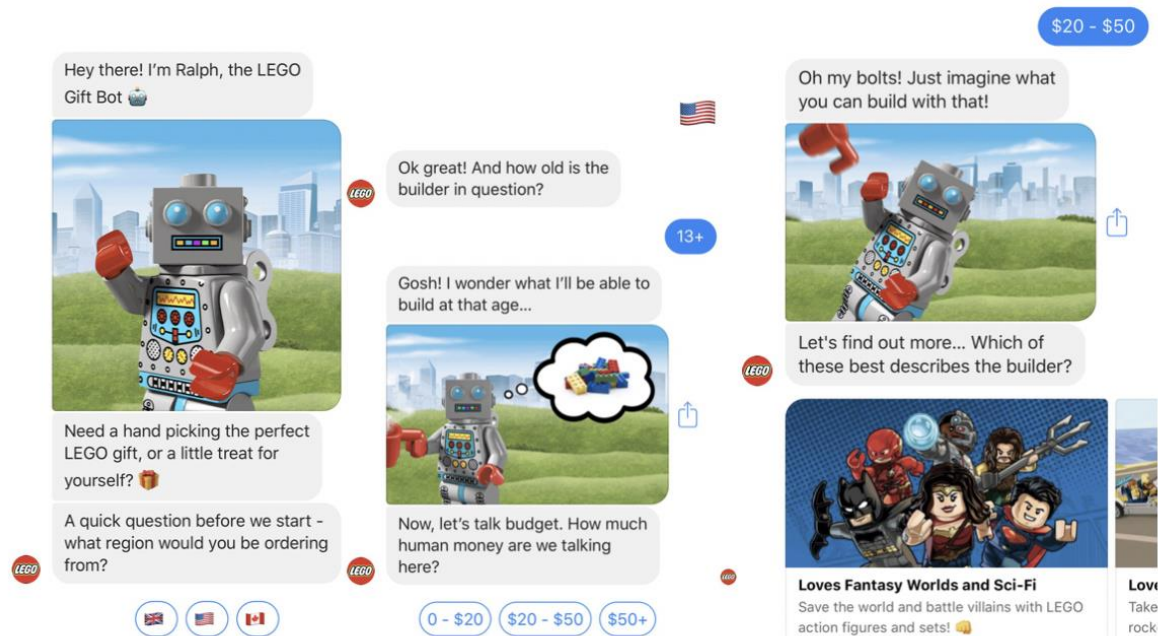

Figure 40: LEGO chatbot

6.4 Fashion

Customers can get personalized shopping recommendations, notify about the latest runway shows or inform about the new collections. Farther, brands can communicate in a more interactive and effective way their values, history, and quality. Some of the best cases are the Tommy Hilfiger and Vogue chatbots.

6.5 Finance

Virtual assistants are used as primary customer support, answering to customer's questions and issues. This supports the assistance in being more efficient and to provide better customer service.

Moreover, chatbots can be used to notify about a received or sent payment, to check the account balance, get stock updates or benefit of other financial services.

6.6 Food & Beverage

Primarily, bots can be used to order food from a delivery service, to reserve a restaurant dinner or to search for healthy recipes to cook.

Some fast food restaurants, such as Taco Bell, Pizza Hut, Domino's Pizza, Burger King, have already implemented a chatbot to allow the customer to order a meal delivered at home or to skip the ordering process at the restaurant.

An interesting and funny case study is the Absolut Vodka chatbot, that offered consumers a complementary drink at a local bar of their choice, encouraging people to try Absolut at a local bar or restaurant. Moreover, after people redeemed the code, the bot sent them a follow-up message with a code for a complementary safe ride home with the Lyft service.

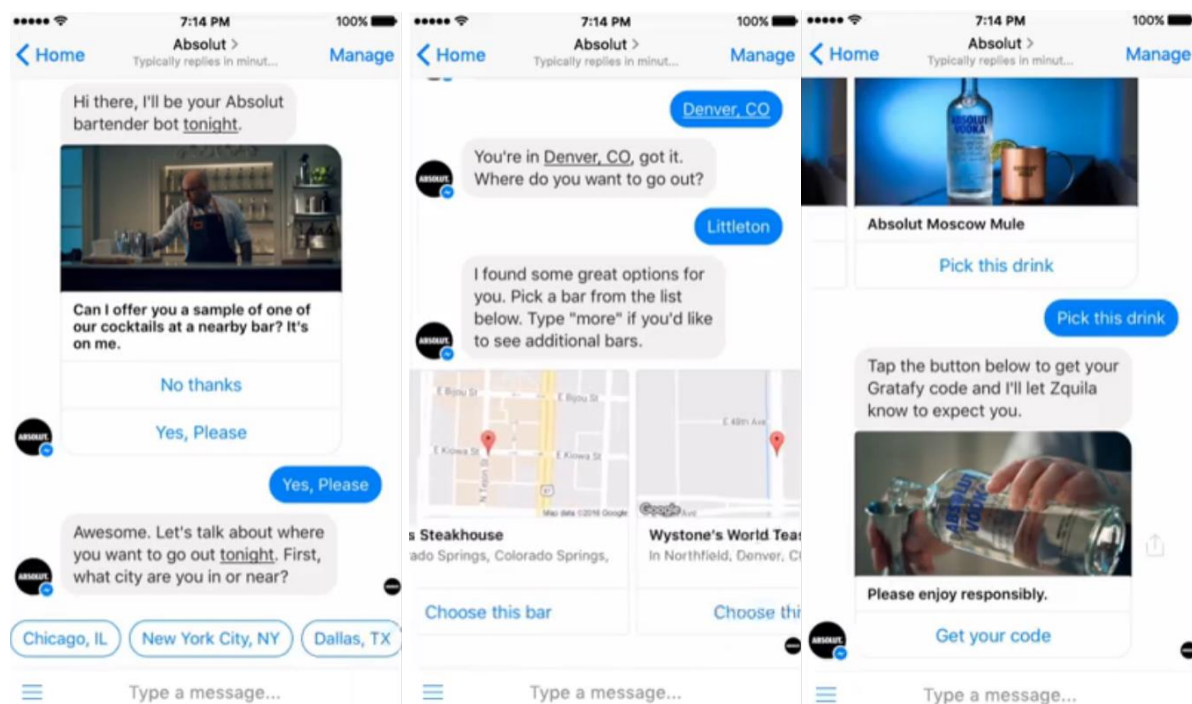As a result, this campaign strengthened brand awareness and increased sales by 4.7 times.

Figure 41: Absolute Vodka chatbot

6.7 Media & Publishers

For this industry chatbots are a great opportunity to deliver content and news in an innovative and more interactive way. For example, the NYTimes built a special bot to make predictions during the USA election in 2016. Other bots can send news and articles according to the user's preferences, in terms of topic and frequency.

Also, sport bots are very interesting since they can send news, alerts, live scores, and other stats, creating a closer relationship with the fans.

6.8 Retail & e-Commerce

As already explained, one of the main opportunities and trends taking momentum is conversational commerce. Thanks to the continuous growth of e-Commerce sales, chatbots are a powerful instrument that can drive online sales to better user experience and subsequent greater results. In fact, they can help the customers proposing the more suitable products according to their needs, answering the questions that can block the purchase process, but also increase the conversion rate with abandoned carts recovery, in a more effective way than emails.

As a matter of fact, the majority of e-Commerce is implementing a chatbot, from the simplest one for small e-shops to the most advanced for big platforms, like eBay.

In a broader perspective, customers are overwhelmed by digital communications, such as notifications, social network posts, advertising, messages and so on. In this context, to differentiate from competitors, companies should exploit this new channel of communication, to attract the attention of the potential customers and to create a personal and trusted relationship.
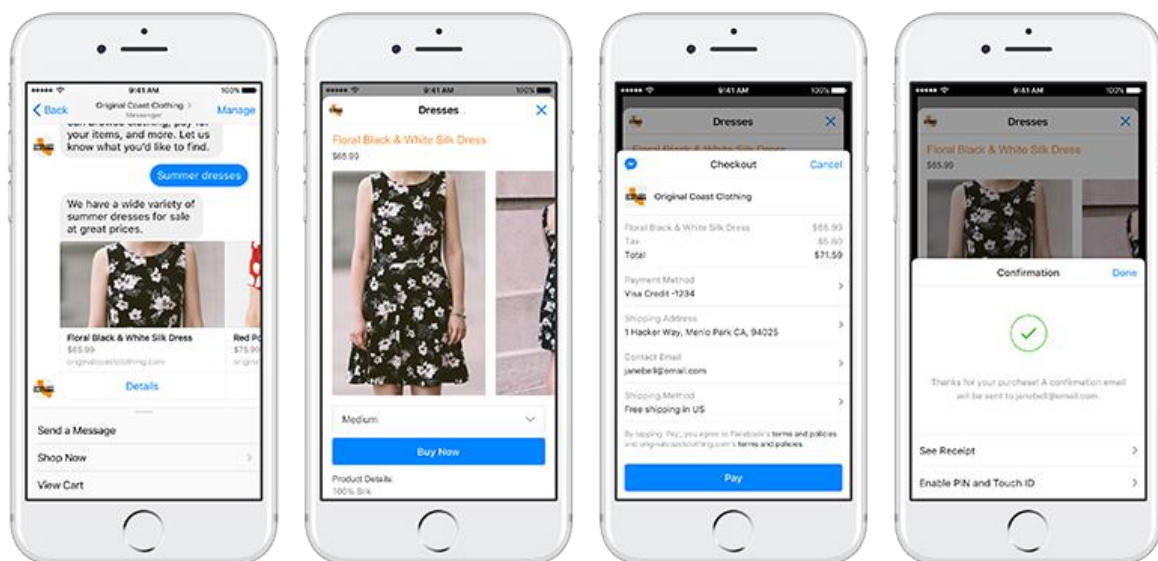

Figure 42: Conversational commerce example

6.9 Travel & Hospitality

Considering the search process to book and hotel and flight, the user can be discouraged considering the whole parameters and choices to fill in a web form. Instead, with a chatbot, the search process is softened, since each preference is asked one by one. Moreover, the bot saves your preferences, that are retrieved in the future researches.

That is why Skyscanner, Hotels.com, Marriott Hotels, Kayak, KLM, Expedia, Lufthansa, British Airways invested in this technology.

For example, KLM developed a smart chatbot with Dialogflow to answer questions, send flight information and boarding passes. The KLM chatbot increases customer interactions by 40% and achieved a 5-point higher average Net Promoter Score.
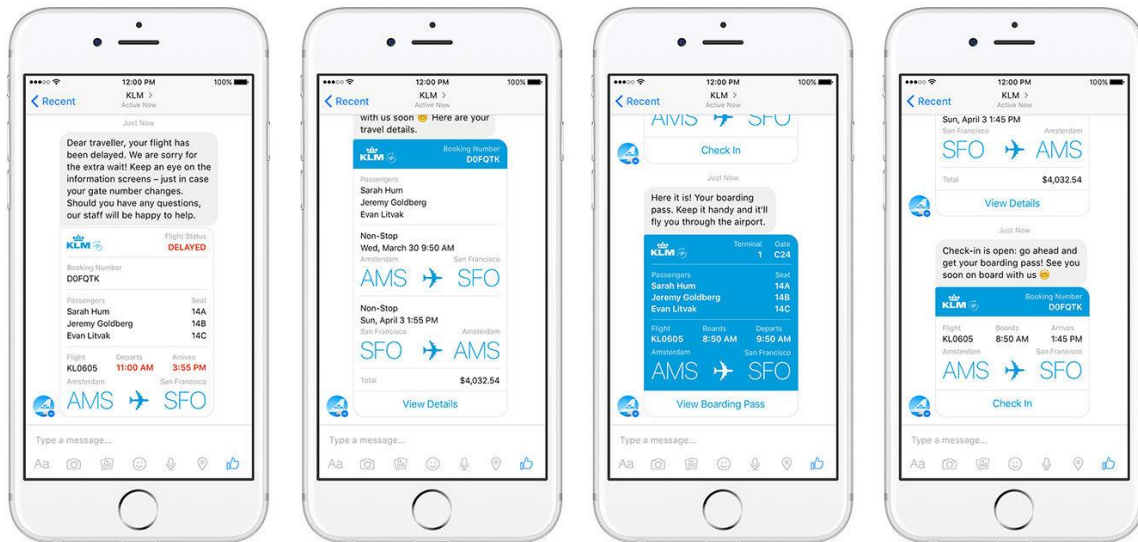

Figure 43: KLM chatbot

6.10 Automotive

From one perspective, through a chatbot, you can order a taxi ride, for example with Lyft or Uber. The number of steps required is lower and the user experience is smoother.

From another perspective, car producers or dealers can support the purchase process with a chatbot telling the specifications of the different car models. For example, KIA used a chatbot, called Kian, that generated 3x more interactions than the corporate site, interacting with 115,000 users per week, and increasing the conversion rate up to 21%.

Furthermore, more opportunities are enabled with cars that integrated vocal assistants, like Amazon Echo, and that are controlled not only by chatbots but also by vocal interaction.

6.11 Others

Finally, there are many more industries like health, insurance, real estate, social good (National Geographic bot), education (Duolingo), utilities, public figures, job-hunting, weather forecast, HR processes, and many more, where a chatbot can be implemented to innovate the market and deliver better customer service.

In general, whether a local business or a small business or an SME but also a multinational enterprise, chatbots are a great opportunity to improve processes efficiency, to increase revenues or simply to enhance the customer satisfaction through an engaging, interactive, personalized, intimate and unique experience.

Conclusions

In conclusion, the work illustrated the main chatbot potentialities and opportunities, highlighting how business can benefit from them. Since the daily messages exchanged worldwide is continuously increasing, companies should consider how to exploit strategically this trend.

In an environment overwhelmed by information and content, consumers are always searching for quick answers to their questions and doubts. In this perspective, chatbots play a key role in enhancing the user online experience, but also in helping businesses to manage the customer service.

Moreover, if chatbots are developed in an innovative and interactive way, businesses could strengthen and tie the relationship with their customers, as made by LEGO or Unilever for example. In fact, thanks to an interactive, personalized and friendly conversation, companies could deliver a value-added service, increasing the brand awareness and customer retention.

In this context, businesses would benefit not only from the reduction of customer service costs but also from growing revenues.

Additionally, new revenues streams are unlocked through the conversational commerce opportunity. Indeed, chatbots are creating new purchasing experiences, simplifying the journey and personalizing the offering according to customer preferences. Furthermore, the integration of a chatbot into an e-Commerce for the shopping cart recovery is taking momentum, due to the high open rates and click-through rates that drive to improved conversion rates.

In a broader perspective, Facebook Messenger is supporting the diffusion of chatbots with a platform that provides all the instruments to exploit this opportunity. In fact, in terms of features, developers would be able to create a complete and advanced conversational experience. Besides, the openness of the platform led to the rising of new services cutting off the entry barriers in terms of competences and costs.

As analysed in this work, those services enable the possibility to build a chatbot without any programming knowledge or competence. In this respect, whether a small or local business, an SME or a multinational enterprise, it is possible to invest in this technology. Particularly, with those chatbot platforms, such as ManyChat, businesses could implement a simple to an extremely advanced chatbot.

As a result, in any type of industry and in any type of enterprise the chatbot's opportunities could be exploited, leveraging on an environment where the entry barriers have been for most removed.

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