

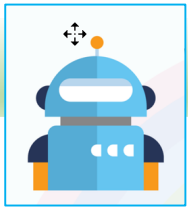
Intelligent Agents & Chatbots



Dr. Azhari MT

Department of Computer Science & Electronics FMIPA UGM, Yogyakarta

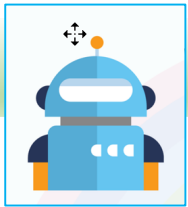
@2020



What is a Chatbot?

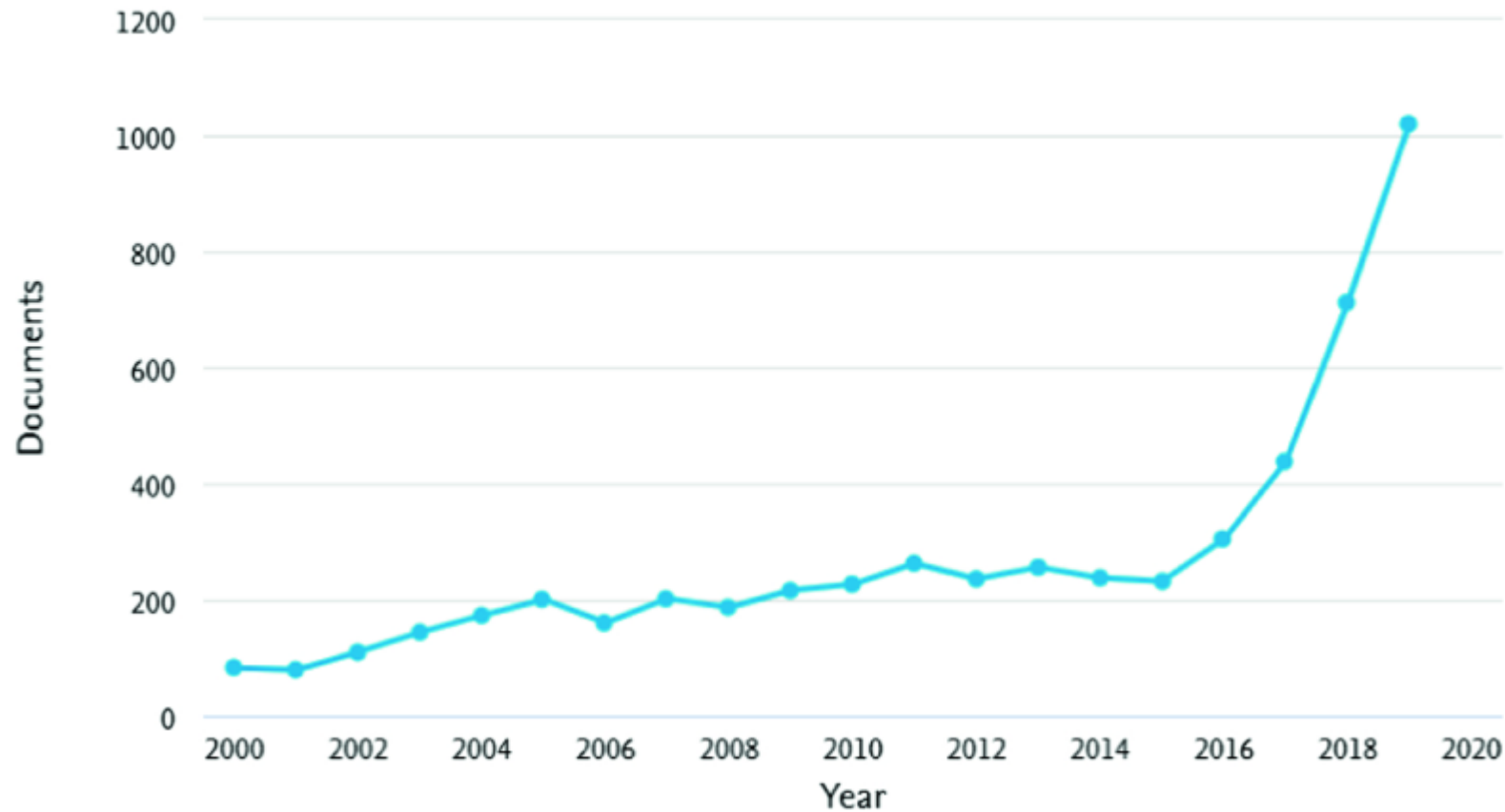
- A chatbot is a computer program that allows humans to interact with technology using a variety of input methods such as voice, text, gesture and touch.
- AI bot, AI chatbot, AI assistant, intelligent virtual assistant, virtual customer assistant, digital assistant, conversational agent, virtual agent, conversational interface.
- A chatbot is a computer program that imitates human conversation, either spoken, written or both.
- Chatbots have conversations with people online, and developers usually design chatbots in the hope that its users will not be able to tell whether they're talking to a person or a robot.



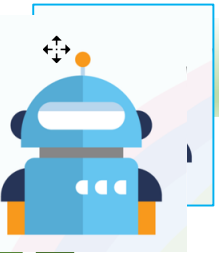


A rapid growth of interest in chatbots

Documents by year



Many chatbots were developed for industrial solutions while there is a wide range of less famous chatbots relevant to research and their applications



Why Business should have Chatbots

<https://chatbotsmagazine.com/the-importance-of-chatbots-in-every-business-infographic-8a8f990be0aa>



The global Chatbot market is expected to grow exponentially between 2016-2023.

(Credence Research)



85% of customer interactions will be managed without a human by 2020.

(Gartner)



32% of executives say voice recognition is the most widely used AI technology in their business.

(Narrative Science)



40% of mobile interactions will be managed by smart agents by 2020.

(Gartner)



6 billion connected devices will proactively ask for support by 2018.

(Gartner)



44% of executives believe artificial intelligence's most important benefit is "automated communications that provide data that can be used to make decisions."

(Narrative Science)



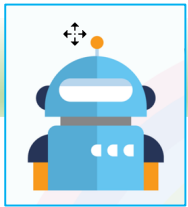
By the end of 2018, "customer digital assistants" will recognize customers by face and voice across channels and partners.

(Gartner)

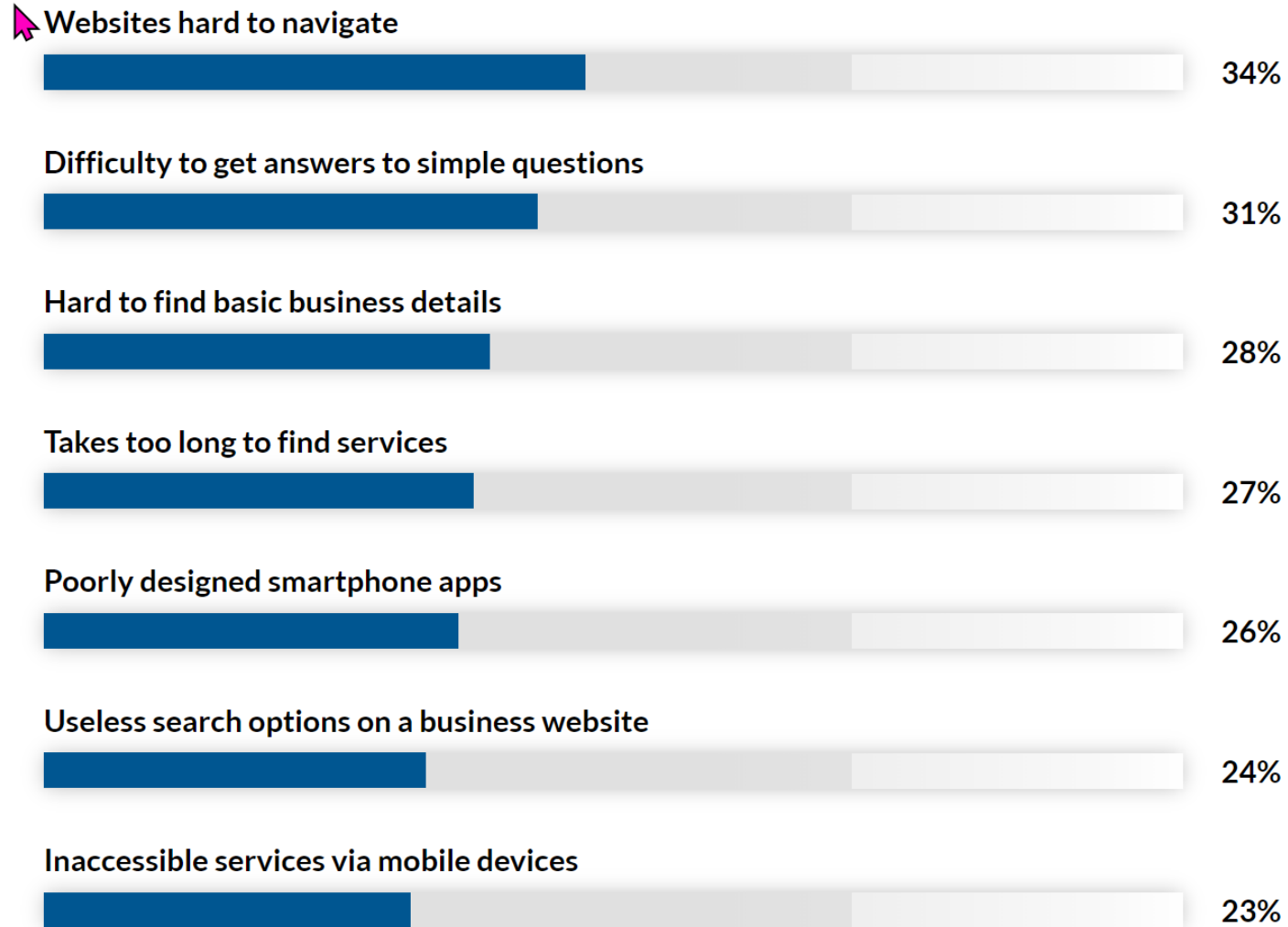


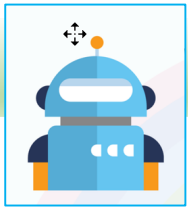
10k+ developers are building chatbots in Facebook Messenger.

(Facebook)



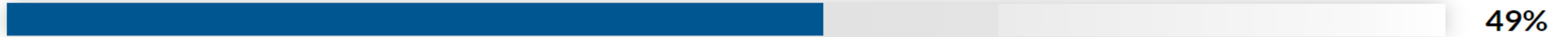
Top Problems with Traditional Online





Top Chatbot Apps Implemented by Businesses 2018

Microsoft Cortana



Apple Siri



Google Assistant



Other chatbots



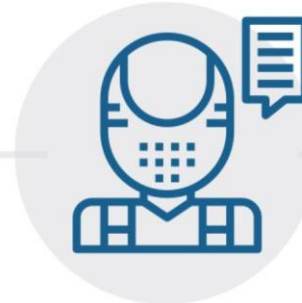
Amazon Alexa



Custom-built AI chatbot

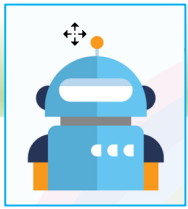


Top 2 Chatbot Benefits Expected by Consumers



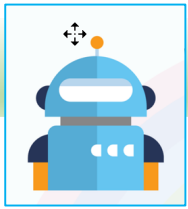
Source: Drift's 2018 State of Chatbots Report

FinancesOnline
REVIEWS FOR BUSINESS



Benefits of Chatbot Statistics

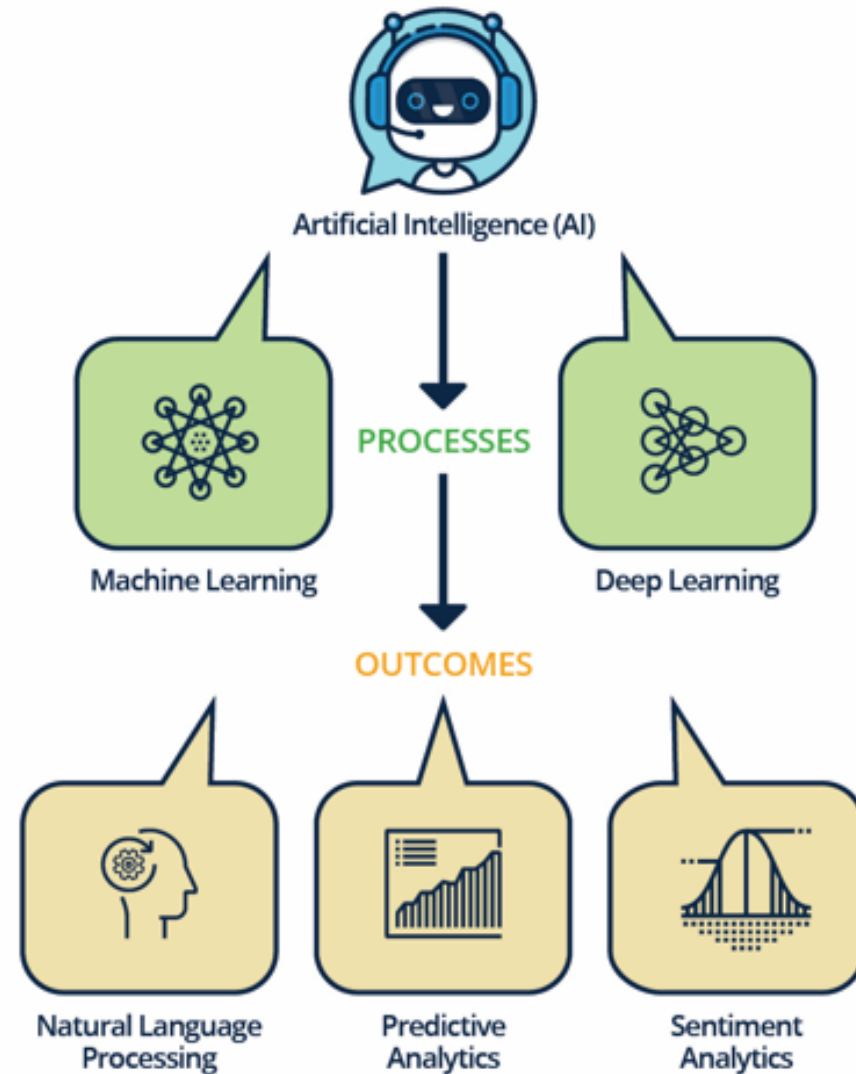
- Automation translates to \$23 billion in savings from annual salaries.
- to save up to 30% in customer support costs.
- 53% of companies use AI chatbots in their IT department.
- 23% use them for administrative tasks.
- 60% of executives say that chatbots improve their agents' ability to handle client queries by networking with other bots.
- 61% of executives say that conversational bots enhance employee productivity via automatic follow up of scheduled tasks.
- 80% of businesses want chatbots by 2020.
- Top expected consumer benefits from chatbots include 24-hour service (64%) and getting an instant response (55%).
- Chatbots or similar technologies will automate 29% of US customer care activities.

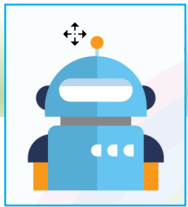


Essential Concepts

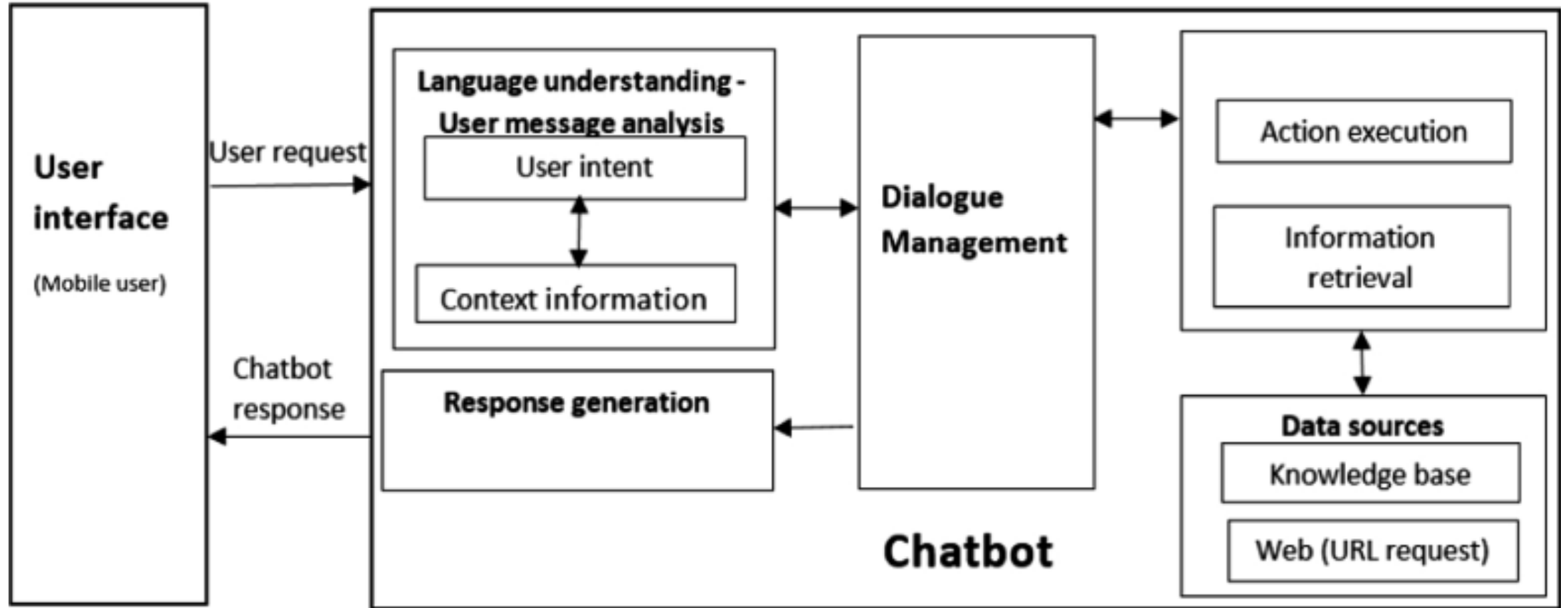
How do Chatbots Work?

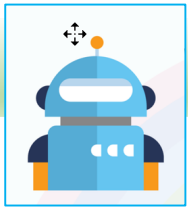
- **Pattern Matching** (Eliza and ALICE)
- **Artificial Intelligence Markup Language**
- **Latent Semantic Analysis (LSA)**
- **Chatscript** , open source
- **RiveScript**
- Automatic Speech Recognition
- Natural Language Processing
- Natural Language Understanding
- **Natural Language Generation (NLG)**
- Machine Learning
- **Intelligent Agents**



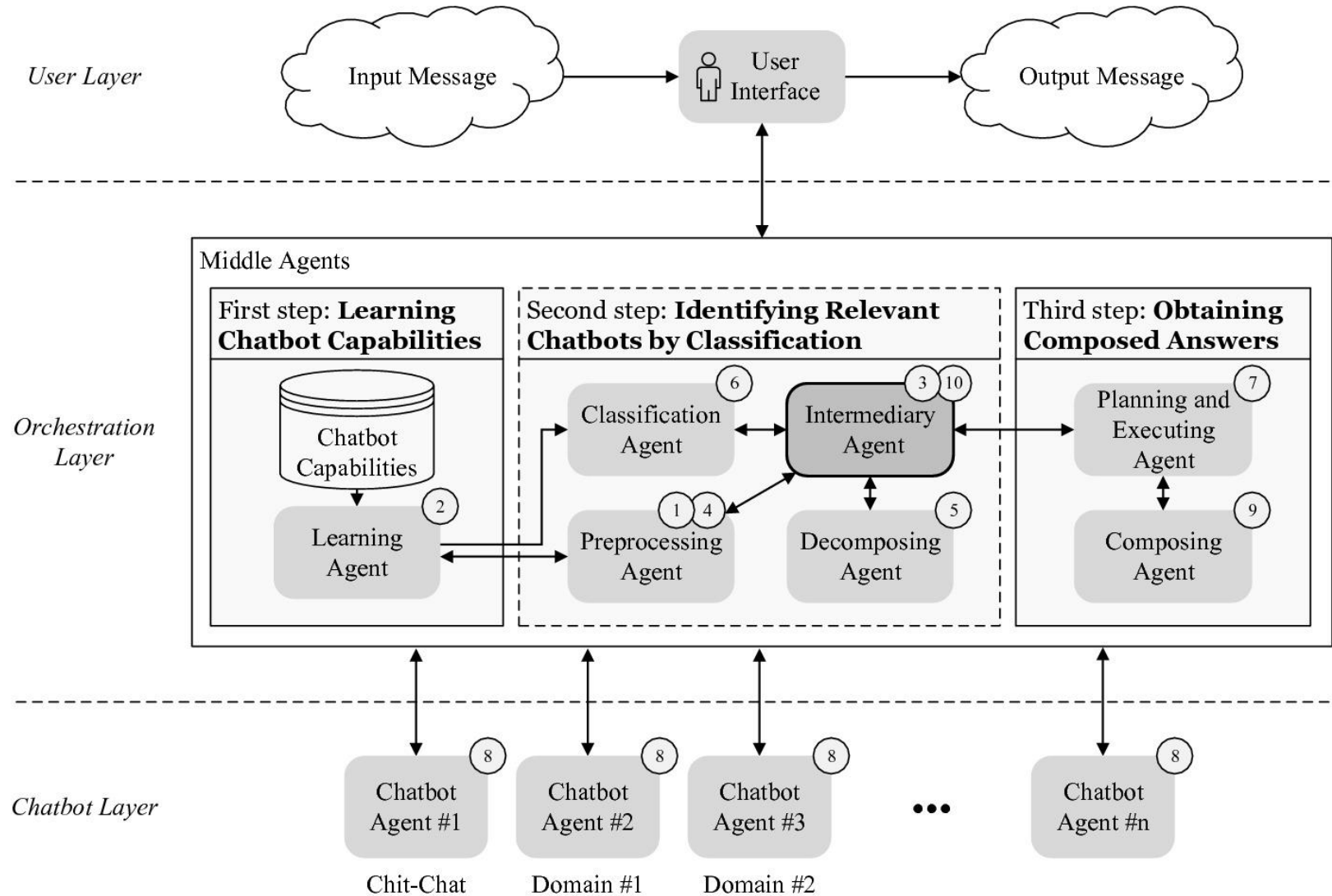


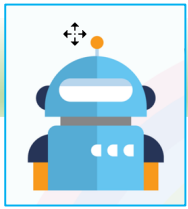
General chatbot architecture





Multi-agent-based chatbots





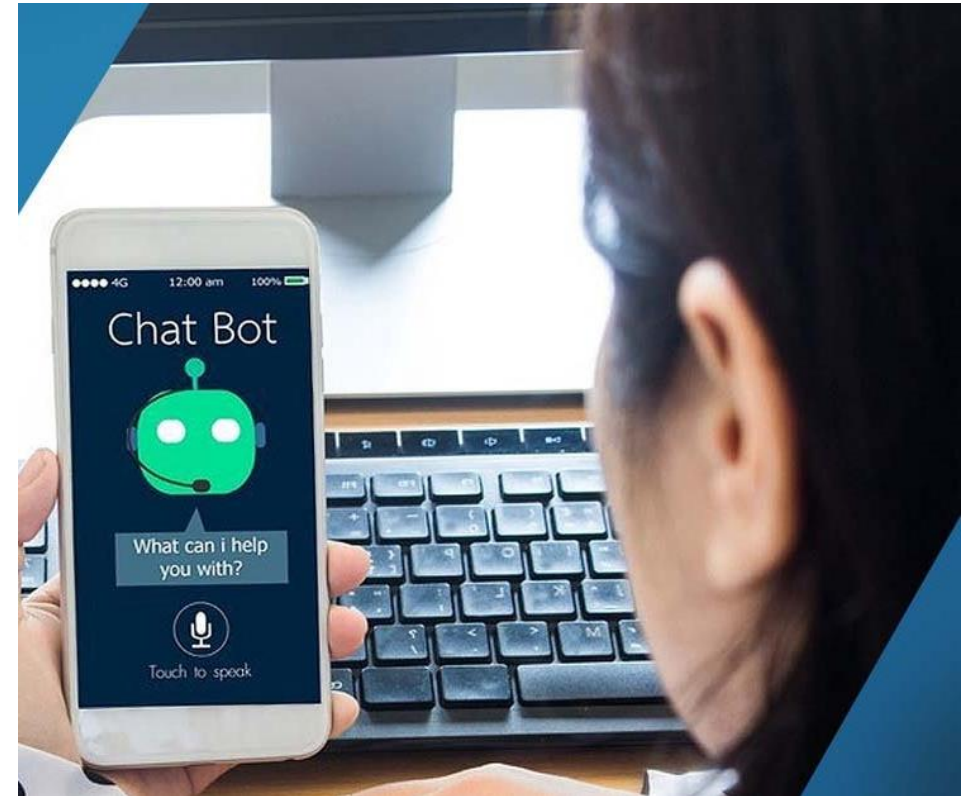
Types of Chatbot Technology

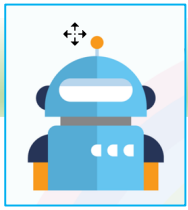
Linguistic Based (Rule-Based Chatbots)

Machine learning (AI Chatbots)

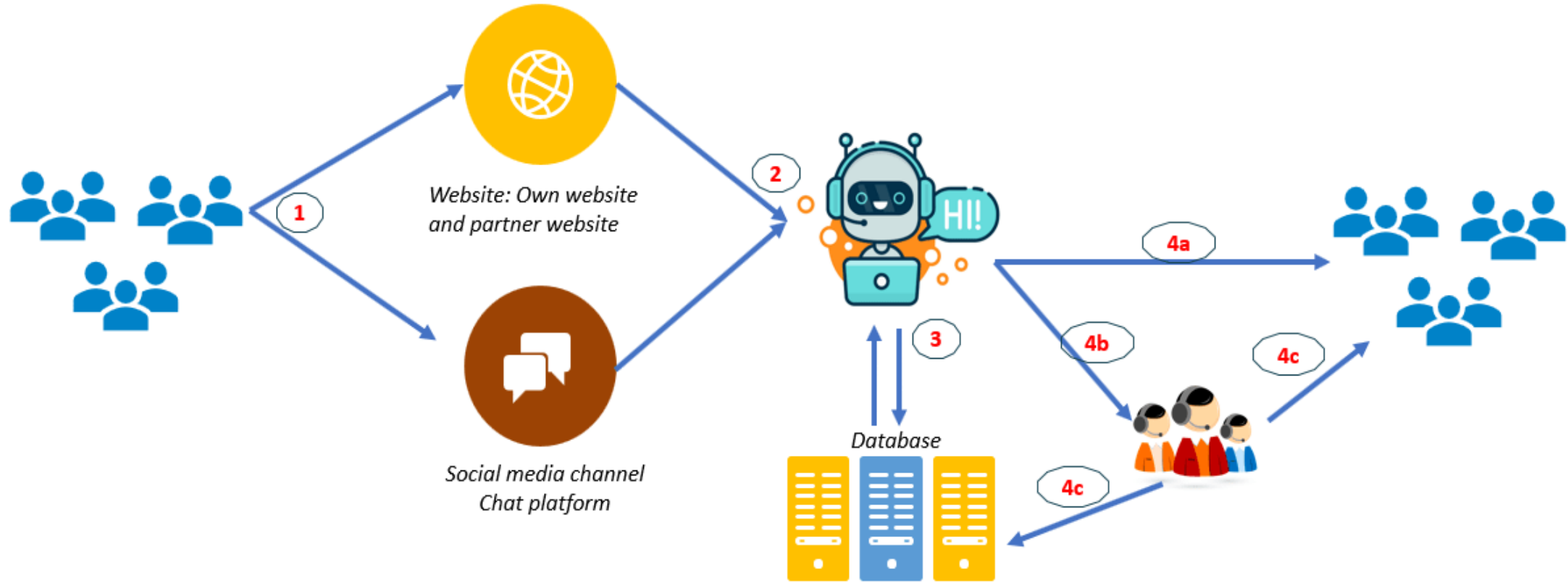
Hybrid Model

The Ultimate Chatbot Experience



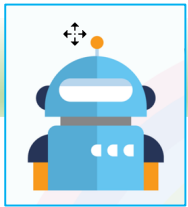


The smart system to operate



- 1 Customer contact to call center via website or social media channel (chat platform)
- 2 Website and chat platform contact to Chatbot
- 3 Chatbot connect to database to get all full data of customers

- 4a Chatbot answer enquiry
- 4b In case chatbot cannot answer enquiry, chatbot will connect to real Agents
- 4c Agent response to customers. Data stored in database. Chatbot learn from agents



AI CHATBOT FOR COVID-19 INFORMATION

- The chatbot, the Rapid Response Virtual Agent program, will provide information to battle the COVID-19 pandemic.
- Respond more quickly to questions from their own customers about the coronavirus.
 - Any Enterprise can provide information related to the COVID-19 pandemic to their customers,
 - such as government agencies, healthcare and public health organizations, as well as travel, financial services and retail industries.
- The AI's Rapid Response Virtual Agent program is available in any of the 23 languages supported by Dialogflow.

<https://www.thebotforge.io/google-cloud-launches-new-ai-chatbot-for-covid-19-information/>

Verily COVID-19 Pathfinder Virtual Agent

Have you traveled outside of the country or been on a cruise in the last 14 days?

No

In the past 14 days, have you had close contact* with someone with known or suspected COVID-19 or possible COVID-19?

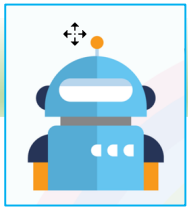
*Within approximately 6 feet (2 meters) for a prolonged period of time while caring for, living with, visiting, or sharing a healthcare waiting area with the person, or having direct contact with infectious secretions, such as being coughed on.

No

Are you 65 years of age or older?

Yes No

Ask something...



Best example Chatbots 2020

Payments via Chatbots

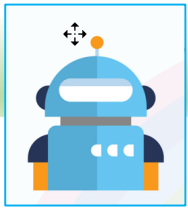


Connecting with the payment infrastructure gives chatbot enough data, that enables you to promote conversation-driven upselling to your users. The same can be used to provide updates about a user's transaction data, payment confirmation, expense records etc., which leads to high user trust and retention.

Voice Bots

Research from Accenture states that digital consumers prefer messaging platforms that have voice and text based interfaces. It's all about facilitating your users with a seamless experience with your business, and you can achieve that by voice-driven chatbots.





Best example Chatbots 2020

Chatbots with a Human Touch

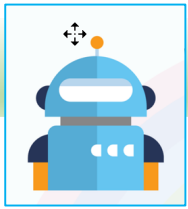


AI based bots that understand and learn from context will prepare support agents for high impact conversations and better customer service. You can expect chatbots to be more human, as a more human chatbot will keep you engaged by driving the conversation forward rather than breaking it.

Chatbots with Emotional Intelligence

Businesses will build and deploy bots with emotional intelligence to bring soft skills to business that will create a profound impact on how consumers reach out and interact with businesses.





Best example Chatbots 2020

Chatbots based on NLP

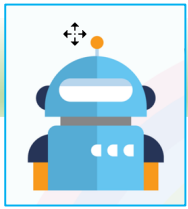


Natural Language Processing (NLP) integrated chatbots will be extremely helpful for organizations that have more customer service scenarios. NLP assesses the intent of the user's input and generates responses in accordance with the context of the input.

Analytics & Insights with Chatbot

With chatbot analytics and insights, you will be able to accurately track and gauge key search terms, preferences, satisfaction allowing you to build stronger relationships and rapport with your customers.





Best example Chatbots 2020



Self-Learning Bots

In 2020 and beyond, companies will not have to spend time feeding new data to bots. They will analyze the pattern in every interaction and train themselves to improve their response capabilities based on user feedback.

Bots on Social Media

We have moved on from just making friends on social media, to voicing opinions, ordering products and services, offering reviews, and even getting in touch with businesses. Facebook has now become a trendsetter in equipping businesses with the ability to use customized chatbots made by other parties to help in this process. Every social media platform is likely to follow suit.



SMS and WhatsApp based Bots

Although these channels are in their nascent stage, in 2020, you will see SMS and WhatsApp bots create a personalized experience and facilitate open-ended conversations with end users.

Thank you!



Ø 636 times a day,
customer service
Chatbots say

THANK YOU

