

Bot development

(Chatbots: Concepts, Development Methods and Tools)
Part 1 – Rule based Tools

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Cognitive Services - Bots

- Conversational services: interact with users using *natural language expressions, both voice and text*
- Designed to mimic human interaction
- Use *software services* to serve *user services*
- Apple Siri, Microsoft Cortana, Google Assistant, Amazon Alexa



Bots - For what use?

- Customer Support
 - User account information
 - Order tracking and delivery
 - Product technical support
 - Incident report
- Sale and advice
 - Make an order, reservation (Hotel, flight, car renting)
 - Ask for personalized advices
- Internal Support
 - Helpdesk (QA)
- Education
 - Course mentors
 - Homework helpers
 - Foreign language learning

Bots - Architecture



A screenshot of a messaging application. At the top, there is a blue robot icon. Below it is a light blue speech bubble containing the text "Location of tweets about Bruno Mars?". At the bottom of the screen, there is a white input bar with a plus sign on the left, the text "Start conversation" in the center, and a checkmark icon on the right.



Bots - Architecture



A screenshot of a mobile application interface. At the top, a blue speech bubble contains the text "Location of tweets about Bruno Mars?". Below it, a white speech bubble contains a world map with colored regions representing tweet locations. At the bottom, there is a white footer bar with three icons: a plus sign, the text "Start conversation", and a checkmark.



Bots - Architecture



A screenshot of a mobile application interface. At the top, there is a large orange rectangular area containing two light blue speech bubbles. The top bubble contains the text "Location of tweets about Bruno Mars?". Below it, a white speech bubble contains a world map with colored dots representing tweet locations. The bottom bubble contains the text "BMW stock price since last Feb?". At the bottom of the screen, there is a white footer bar with three items: a plus sign icon, the text "Start conversation", and a checkmark icon.

Location of tweets about Bruno Mars?

BMW stock price since last Feb?

+ Start conversation ✓



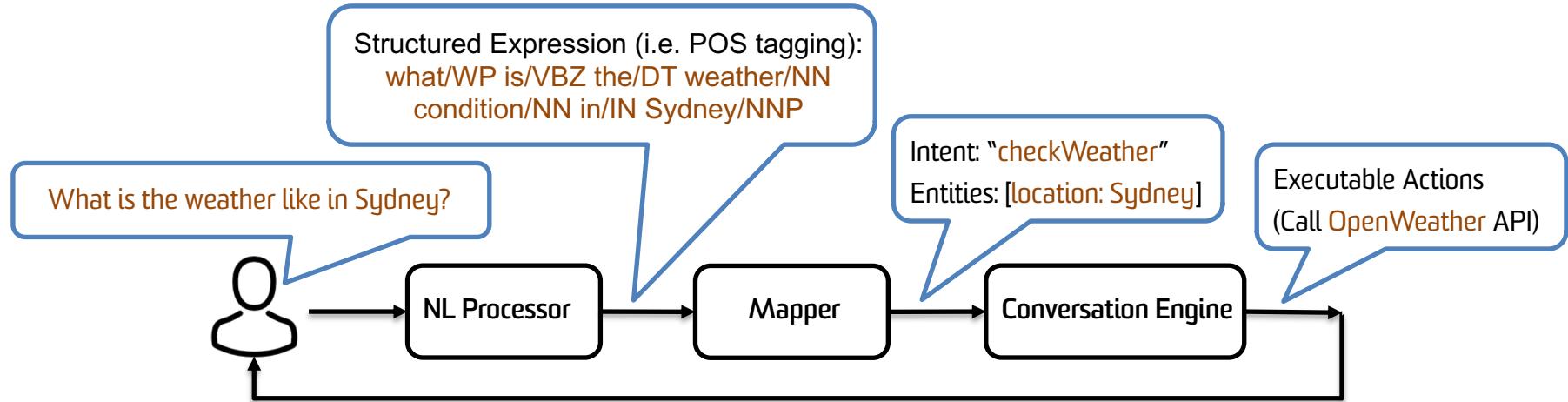
Bots - Architecture



The image shows a mobile application interface with an orange background. At the top, a light blue speech bubble contains the text "Location of tweets about Bruno Mars?". Below it, a white speech bubble contains a world map with colored dots representing tweet locations. In the middle, another light blue speech bubble contains the text "BMW stock price since last Feb?". Below it, a white speech bubble contains a bar chart showing BMW stock price over time. At the bottom, there is a white footer bar with a plus sign on the left, the text "Start conversation" in the center, and a checkmark icon on the right.



Bots - Architecture



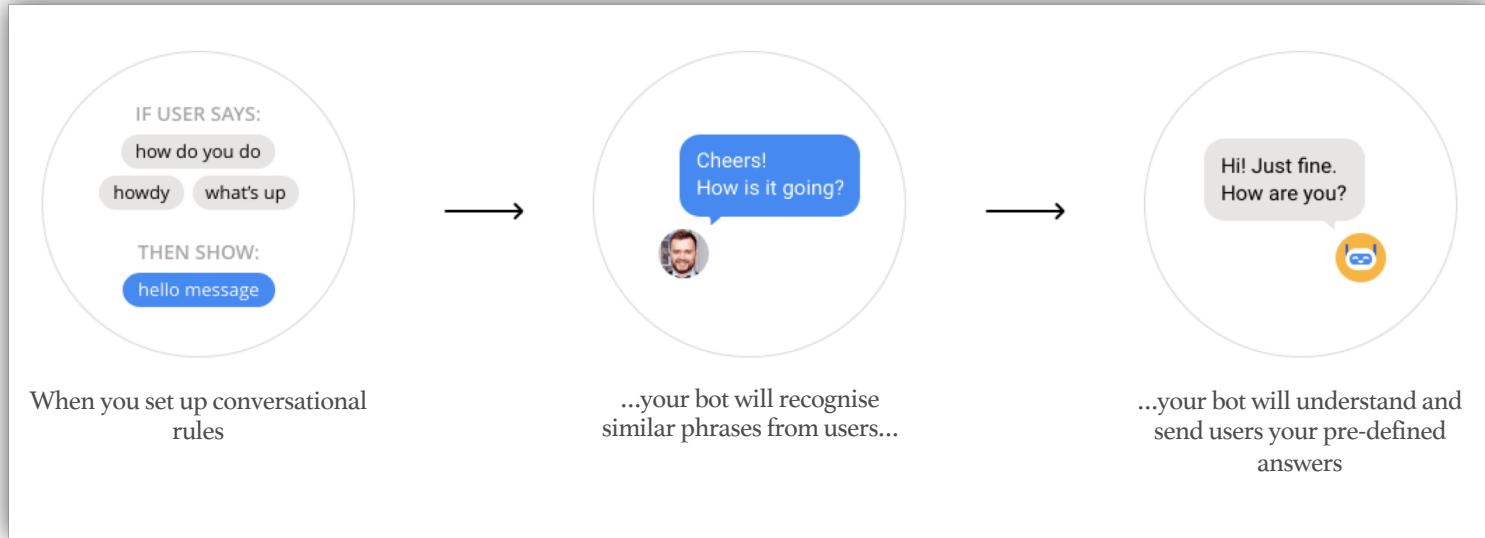
Bot Development Approaches

- Rule Based (Deterministic)
 - Defining static rules (If...Then...) to dictate the behaviour of bot
- Machine Learning Based (Probabilistic)
 - Training ML models to predict user intention and extract entities
- Code Based vs Visual
 - Coding the conversation by defining functions for intents
 - Designing the conversation by using UI components (No coding)

Rule-Based Bots

- Quick bootstrapping
- Fast and accurate (IF...Then...)
- As smart as it is programmed to be
- Communicates in a structured manner (Fairly controlled natural language)
- Become complicated in long time (overlapping between rules)

Rule-Based Bots (IF ... Then ...)



<https://chatfuel.com>

Rule-Based - Language Examples (AIML)

- AIML stands for **Artificial Intelligence Modelling Language**
- It is an **XML** based markup language
- It was developed by Dr. Richard S. Wallace during 1995-2000
- It was used to create **Alicebot** - one of the strongest chatbots which won the Loebner Prize three times (in 2000, 2001 and 2004)

Rule-Based - Language Examples (AIML)

```
<aiml version="2.0">  
  
  <category>  
    <pattern>hello bot</pattern>  
    <template>hello human</template>  
  </category>  
  
</aiml>
```



Human: hello bot

Matched: HELLO BOT (category defined in [pand_learn.aiml](#))

testbot: hello human

[Say Instead](#)

[Advanced Alter Response](#) [Ask Again](#) [Trace](#)

<https://playground.pandorabots.com>

More details: https://www.tutorialspoint.com/aiml/aiml_introduction.htm

Rule-Based - Language Examples (RiveScript)

- RiveScript is a simple scripting language for chatbots
- Easy to learn syntax (No need to know XML)
- Available libraries in Go, Java, JavaScript, Perl or Python.

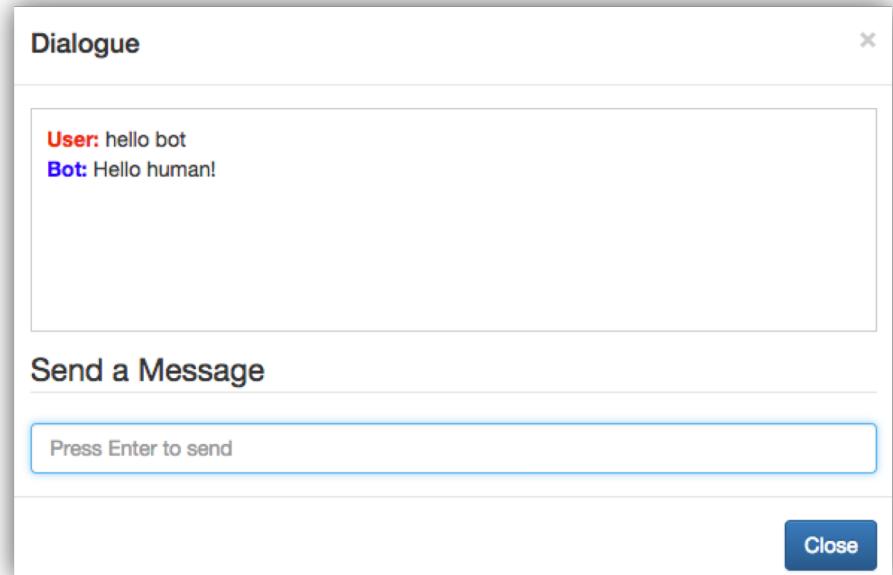
Rule-Based - Language Examples (RiveScript)

`! version = 2.0`

`+ hello bot`



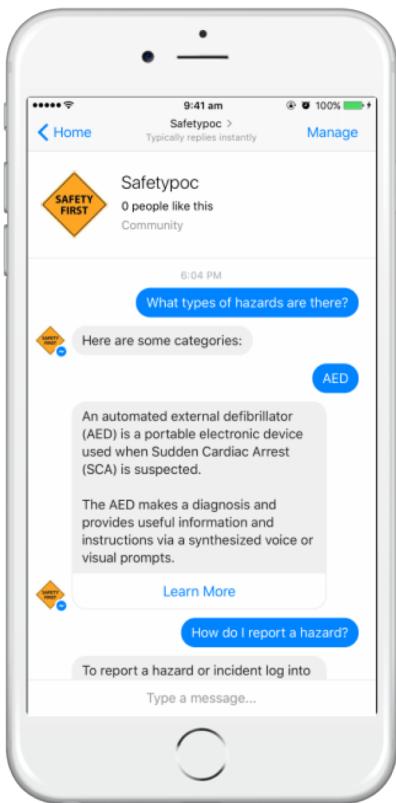
`- Hello human!`



<https://www.rivescript.com/try>

More details: <https://www.rivescript.com/docs/tutorial>

Rule-Based Bot - UNSW Health & Safety Helper



The screenshot shows the UNSW Health & Safety website homepage. The header features the UNSW Australia logo and navigation links for Procedures & Forms, Health & Safety Statistics, News, Legislation and Weblinks, and Contacts. The main content area has a large image of a person's legs with a cast on one. To the right, a prominent orange sidebar reads "Reporting Hazards & incidents". Below this, a "SEE ALSO" section lists Human Resources, Emergency, and Facilities Management with corresponding icons. A live chat window on the right side says "Ask Tina for help" and "Please let me know how can I close a hazard?". At the bottom, there's a message input field with "Type your message here..." and a green send button.

UNSW Health & Safety

Procedures & Forms | Health & Safety Statistics | News | Legislation and Weblinks | Contacts

Reporting Hazards & incidents

SEE ALSO

- Human Resources
- Emergency
- Facilities Management

Ask Tina for help

Please let me know how can I close a hazard?

To close a hazard or incident log into myUNSW. Go to My Staff/Student Profile, then "My Profile" then "Health, Safety & Environment". Click on "Manage Hazard/Incident". Press the "Search" button so that all issues logged to you appear. Click on the one you are interested in. Scroll to the "Corrective Action Required" section. In the "Click to"

Type your message here...

DEMO

Activity 1: Rule-based Chatbot

Please follow the instruction explained in

<https://cloudstor.aarnet.edu.au/plus/s/GcBbgrXtUatEcQG>

Rule-Based - Languages and Libraries Examples



ChatScript

RiveScript

pandorabots

AIML

SuperScript