

ORACLE

# Introduction to Entities

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# Program agenda

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- 1 Human vs AI: Understanding
- 2 Entity types
- 3 Entity properties
- 4 Entity extraction

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- 1 **Human vs AI: Understanding**
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Humans have a natural ability to understand a conversation and extract all relevant information from it.

# At the restaurant

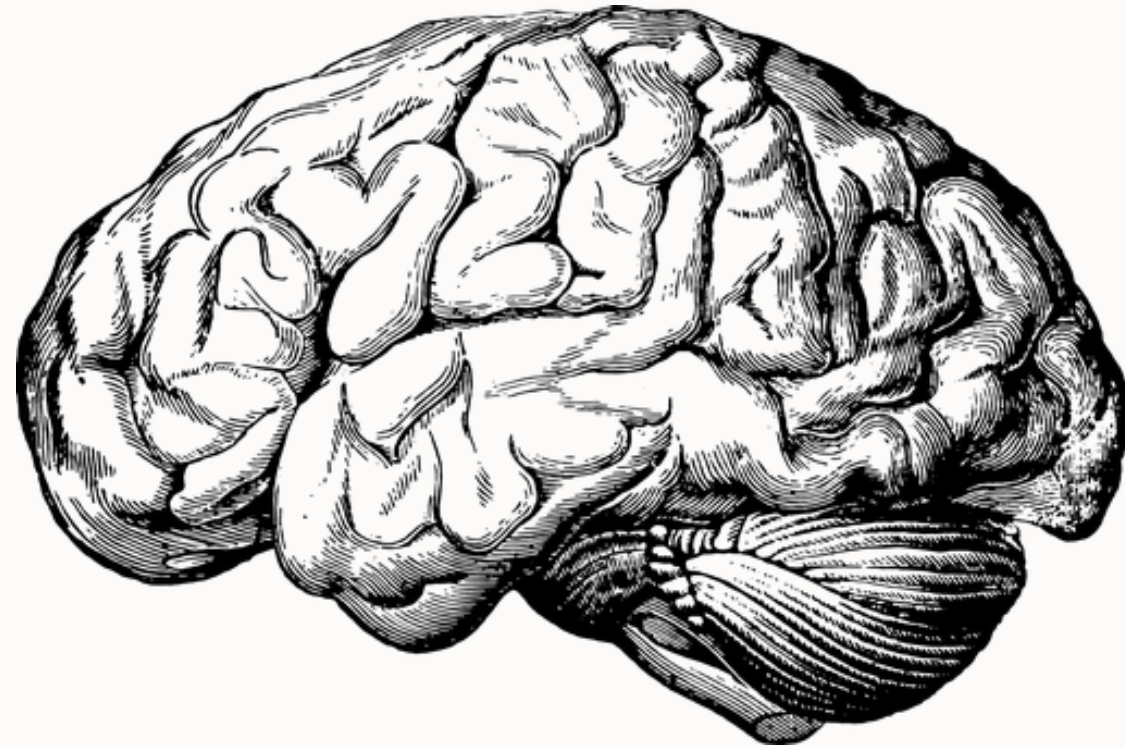
I'd like the fried cod with curry sauce, a salad and French fries

Action: food order (must go to kitchen)  
Main course: Fried cod with curry sauce  
Side dishes: salad and French fries  
Missing: a drink



# How it works

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# Conversational AI

Conversational AI is a discipline of artificial intelligence

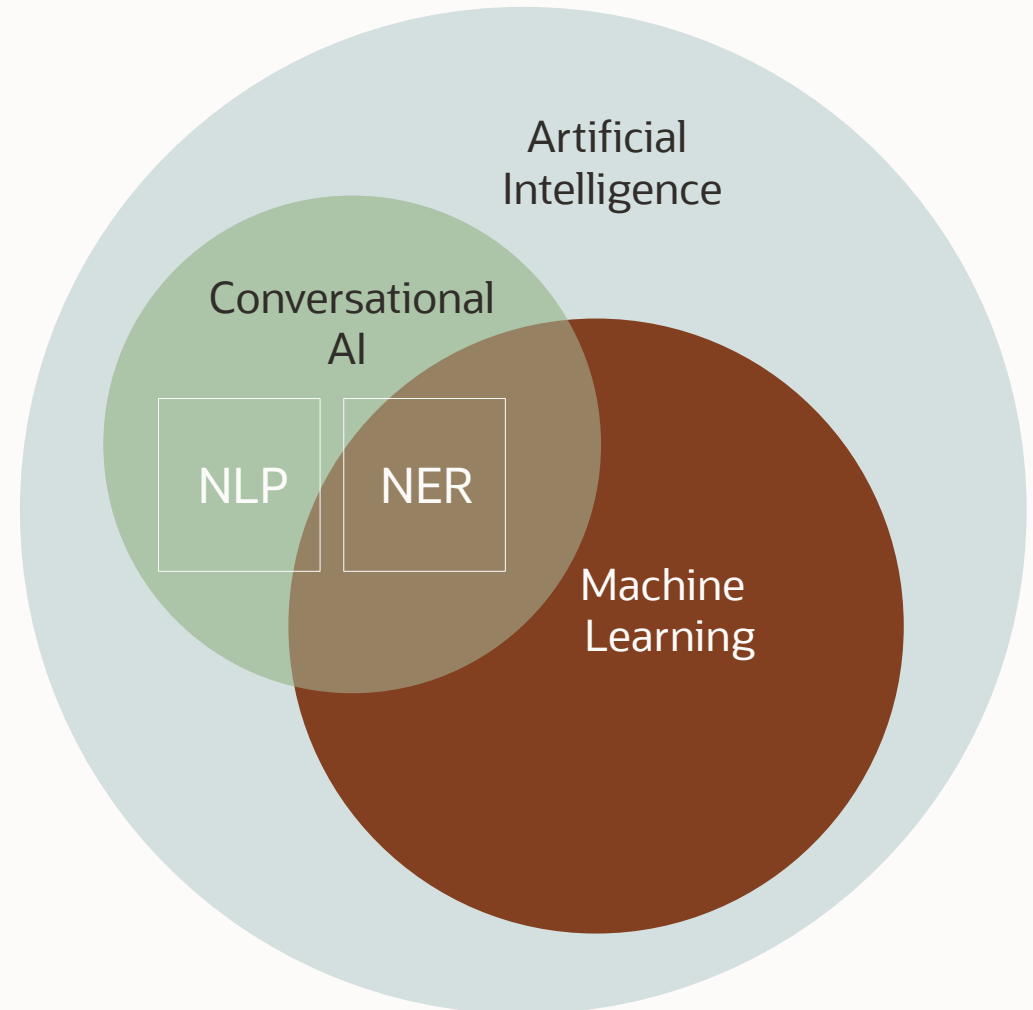
- Uses a machine learning model as its brain

Uses machine learning to detect what a user wants

- Natural language processing (NLP)

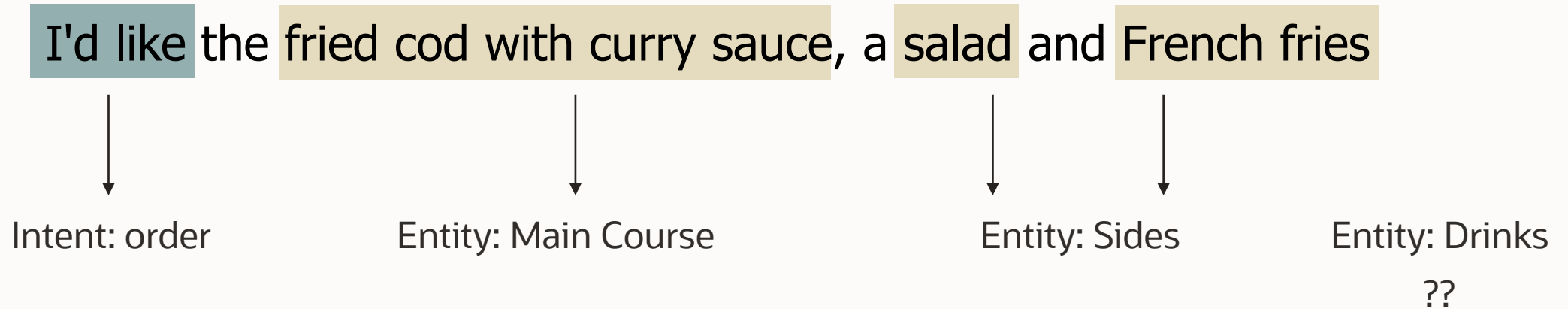
Uses machine learning to extract information from what a user said

- Named Entity Recognition (NER)



# The machine learning side of things

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Entities extract information from a user message

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Conversation flow determines order in which user is asked to provide information

Entities extract information based on patterns, list of known values and synonyms, and machine learning models

Extracted information is "slotted" to the conversation so the user will not be prompted for it again

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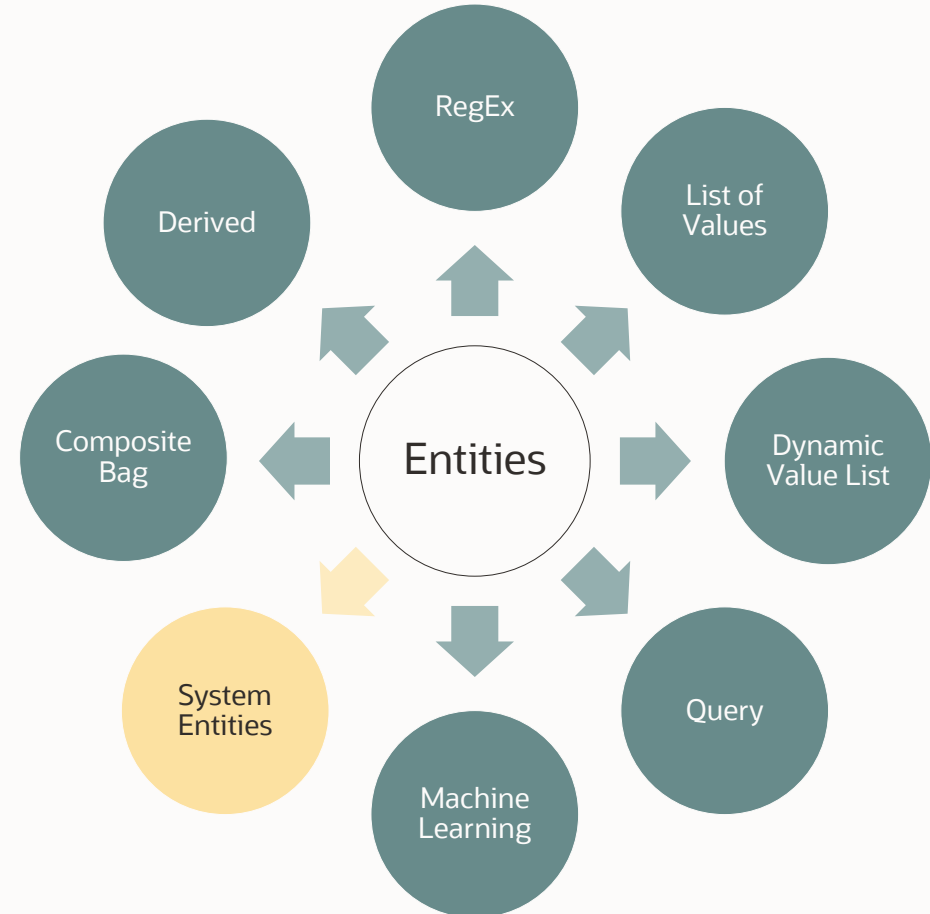
# Entities in Oracle Digital Assistant

## System entities

- Built-in, provided as part of platform
- DATE\_TIME, NUMBER, CURRENCY, EMAIL, YES\_NO, PERSON, ADDRESS, and more.

## Custom entities

- Value list, regular expressions, derived
- Dynamic entities
- Machine learning entities
- Composite bag entities
- Query entities



# Entity types

## System (built-in) entities

- No configuration required, but some have locale settings
  - e.g. DATE\_TIME, CURRENCY
- Ready to use

Utterance

Hi, today I subscribed to 2 cloud services at www.oracle.com under Frank Nimphius with registered address Frank@mail.com

Detected Entities

Label View List View

Hi, today I subscribed to 2 cloud services at  
DATE NUMBER  
www.oracle.com under Frank Nimphius with registered  
URL PERSON  
address Frank@mail.com  
EMAIL

# Entity types

## Custom entities

### Value list entity

- a list of values with optional synonyms

### Regular expression entity

- e.g. license plates, social security number

### Composite bag entity

- Groups one or many entities and items of type String, Location, Attachments as bag items into a single business object
- Items are resolved together without you having to write code

Type

Value list

+ Value

Value	Synonyms
Small	<b>personal , smallest</b>
Medium	<b>middle</b>
Large	<b>big , grande , biggest</b>

Type

Regular Expression

Regular Expression

`^\d{3}\s?\d{3}$`

Type

Composite Bag

Event Handler

+ Event Handler

Bag Items

+ Bag Item

Name	Type	Entity Name	Sequence Number
PizzaSize	ENTITY	PizzaSize	1
PizzaTopping	ENTITY	PizzaTopping	2
PizzaDough	ENTITY	PizzaDough	3
DeliveryTime	ENTITY	TIME	4

# Entity types

## Custom entities

### Dynamic entity

- Value list entity which you update at runtime
- Uses Oracle Digital Assistant REST API

### Machine learning entity

- Uses a model to identify the entity values in a user message. It allows extraction of unknown values

### Query entity

- This entity supports the implementation of SQL Dialog with the conversion of natural language to SQL

Value	Synonyms
Small	personal , smallest
Medium	middle
Large	big , grande , biggest

**Entities**

Entities Dataset

ML Entities Composite Entities

Filter utterance...

Show un-annotated utterances only

**English** ⓘ

I want to declare a **Taxi** expense

I payed last week the **Dinner** in the corporate event

How can I get reimbursed for the **Train** expense?

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# Entity properties

Control entity behavior and message responses

## Common properties

- Name, Description
- Error Message, Prompts
- Multiple values
- Disambiguation resolution and –prompt
- Custom validation to perform on top of entity validation

## Type dependent properties

- Value lists
- Value prefix or postfix (derived entity)
- Fuzzy match
- Regular Expression
- Value translations (value list entities)

The image shows a configuration interface for an entity. It is divided into several sections:

- Fuzzy Match:** A toggle switch that is currently turned off.
- Match Original Value:** A toggle switch that is currently turned off.
- Disambiguation Resolution:** A section with a toggle switch for "Prompt for Disambiguation" which is turned on. Below it is a text input field for the "Disambiguation Prompt".
- Prompts:** A section with a "+ Prompt" button. Below it is a "Prompt" field containing the text "Please enter a value?".
- Validation Rules:** A section with a "+ Validation Rule" button.

On the right side, there is a detailed view of a value list configuration:

- Name:** list.OrderStatus
- Description:** Extract the order status from a query message
- Configuration:**
  - Type:** Value list
  - English:** A "+ Value" button is present. Below it, the text "Value (Primary Language)" is shown, followed by "No data to display."
  - Enumeration Range Size:** An empty text input field.
  - Error Message:** An empty text input field.
  - Multiple Values:** A toggle switch that is currently turned off.



# Entity properties

We can define multiple prompts, allowing variance in the responses

Prompts	
Prompt	Sequence Number
What size of pizza would you like?	1
Please choose small, medium or large.	2
We have S, M and L. Which one do you prefer?	3

Validation rules to implement business logic

Validation Rules	
Expression	
<code>{{(pizza.value.DeliveryTime.hrs?number &lt; 10)?then('true','false')}}</code>	

Error Message
We close at 10 PM. Please order before.

Error messages for when the user provides a value that is not valid

Error Message
Sorry, <code>'\${system.entityToResolve.value.userInput!this}'</code> is not a valid size of pizza.

# Entity properties

Some properties are specific to a custom entity type

- *Value* and *Enumeration Range Size* for Value List and Dynamic Entities
- *Regular expression* value in the regular expression entity
- *Query entities* are the odd ones, as they have a completely different set of options

The screenshot shows a configuration interface for a 'Value list' entity. At the top, the 'Type' is set to 'Value list'. Below this, the language is set to 'English'. There is a '+ Value' button to add items. The 'Value (Primary Language)' field is empty. Below the field, it says 'No data to display.' and shows a pagination control for 'Page 1 (1-1 items)'. At the bottom, there is an 'Enumeration Range Size' field which is currently empty.

The screenshot shows a configuration interface for a 'Regular Expression' entity. The 'Type' is set to 'Regular Expression'. Below this, there is a 'Regular Expression' field containing the text '^\\d{3}\\s?\\d{3}\$'.

# Entity properties

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Extra Properties with Composite Bags

Out of Order Extraction

- Extracts the entity even when not prompted

Extract With

- Extends the extraction with another entity

Conditional Prompt

- Only prompts when a condition is met

### Extraction Rules

Out of Order Extraction ?

i Please review this field based on your need.

Extract With ?

Prompt for Value ?

## Entity Properties

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” System entities have no properties

But you can use Composite Bags to wrap system properties

This gives you access to all the available configuration properties

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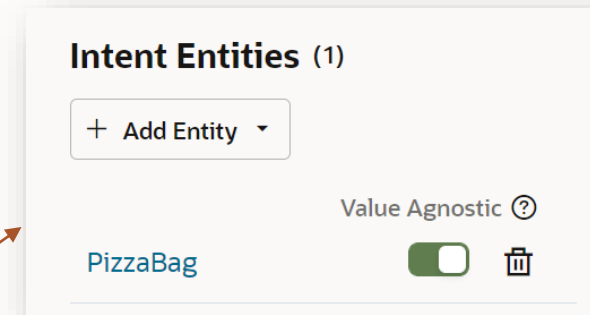
# Entity extraction through NLP

Entities should be associated with an intent to be extracted

Multiple values can be extracted for a specific entity

- Saved in an array

Entity extraction can be tested in model tester



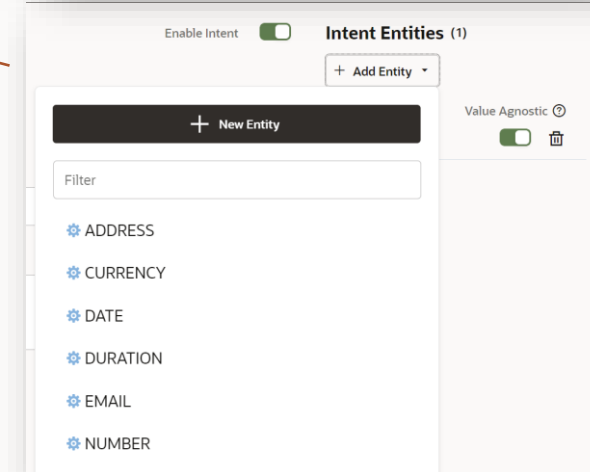
Intent Entities (1)

+ Add Entity

Value Agnostic ?

PizzaBag

This screenshot shows the configuration for a single intent entity named 'PizzaBag'. It includes an 'Add Entity' button, a 'Value Agnostic' toggle which is currently turned on, and a trash icon for deletion.



Enable Intent  Intent Entities (1)

+ Add Entity

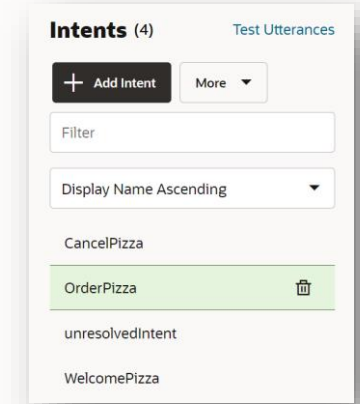
+ New Entity

Value Agnostic ?

Filter

- ADDRESS
- CURRENCY
- DATE
- DURATION
- EMAIL
- NUMBER

This screenshot shows the configuration for the 'Intent Entities' section. It includes an 'Enable Intent' toggle (checked), an 'Add Entity' button, and a 'New Entity' button. A list of entity types is displayed, including ADDRESS, CURRENCY, DATE, DURATION, EMAIL, and NUMBER. The 'Value Agnostic' toggle is also present.



Intents (4) Test Utterances

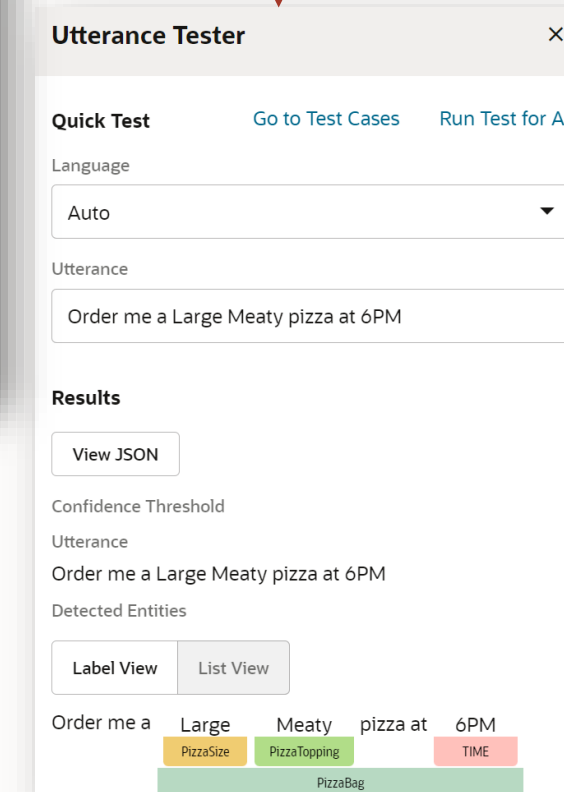
+ Add Intent More

Filter

Display Name Ascending

- CancelPizza
- OrderPizza
- unresolvedIntent
- WelcomePizza

This screenshot shows the configuration for four intents. It includes an 'Add Intent' button, a 'More' dropdown, a 'Filter' input, and a 'Display Name Ascending' dropdown. A list of intents is shown, with 'OrderPizza' highlighted in green.



Utterance Tester

Quick Test Go to Test Cases Run Test for All

Language Auto

Utterance Order me a Large Meaty pizza at 6PM

Results View JSON

Confidence Threshold

Utterance Order me a Large Meaty pizza at 6PM

Detected Entities

Label View List View

Order me a Large Meaty pizza at 6PM

PizzaSize PizzaTopping TIME

PizzaBag

This screenshot shows the 'Utterance Tester' interface. It includes a 'Quick Test' section with 'Go to Test Cases' and 'Run Test for All' buttons. The 'Language' is set to 'Auto'. The 'Utterance' field contains 'Order me a Large Meaty pizza at 6PM'. The 'Results' section shows a 'View JSON' button and a 'Confidence Threshold' field. The 'Utterance' field is repeated, and the 'Detected Entities' section shows 'Order me a Large Meaty pizza at 6PM' with labels for 'Large' (PizzaSize), 'Meaty' (PizzaTopping), 'pizza at' (TIME), and '6PM' (TIME). A 'PizzaBag' label is also shown at the bottom.



# Entity extraction

## using components

The components **Resolve Entities** and **Resolve Composite Bag** resolve entities

- If variable type is an entity, then entity value gets extracted from the user input
- Composite bag entity type variables can extract multiple values
- If value is not provided in input, the component prompts for it

The 'Create Input Parameter' dialog box contains the following fields and options:

- Name:** cbpizza
- Description:** Optional short description for the parameter
- Required Parameter**
- Type:** Entity
- Entity Name:** cbe.pizza
- Expression:**
- Initial Value:** 1
- Enter a valid strict (using double-quotes) JSON-syntax definition of an object if you'd like to define a default value when the input parameter is not passed in.
- Apply** button

The 'resolveBag' component configuration panel shows the following details:

- Component:** resolveBag
- Composite Bag Entity Variable (Flow Scope):** cbpizza
- Bag Item / Prompt Table:**

Bag Item	Prompt
Date	When do you want it delivered?
PizzaType	What is the Pizza Type?

Go to Entity to edit prompts

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