

ORACLE®

Oracle Digital Assistant

The Complete Training

Custom Component Design

Safe Harbor Statement

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Topic agenda

- 1 ➤ Message handling
- 2 ➤ Backend integration
- 3 ➤ Error handling
- 4 ➤ Writing responses vs. writing data
- 5 ➤ Custom component vs. CR component

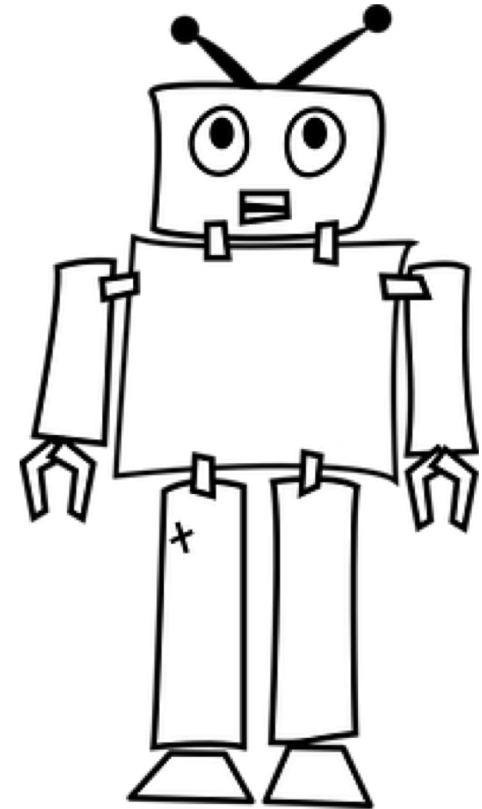
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"We built a custom component to display cards. **A click on an action does not trigger navigation** nor does it set the value of a variable"



The word ***custom*** in custom component actually means '***on your own***'



Creating components that interact with users

- Custom components that interact with users need to
 - Pause transition after the initial UI rendering
 - Not calling `conversation.transition()` ensures the custom component state remains current
 - A call to `conversation.keepTurn(false)` passes input control to the user
 - Manage state
 - Keep track of whether the component needs to render its UI or awaits user input
 - You can use simple or complex state token to keep track of UI and data states
- At the end of the component processing
 - Call `conversation.transition(string)` to continue dialog flow navigation
 - Using `conversation.keepTurn(true)` navigates without waiting for a user input

Option 1: manage state in a context variable

- Create and manage context variable in custom component
 - E.g. `conversation.variable('_aUniqueStateTokenName_', stateValue);`
- State token can be string or object (for complex state tracking)
- For every incoming message
 - Check state variable for what to do
 - Determine message type
- Context variable gets deleted when conversation ends with return statement

Option 2: add a token to an action payload

- Add extra attribute to payload when rendering buttons or action items
 - Payload defined a JSON object
 - { "orderId:"1234567", "_mystatetoken_":"value" }
- For every incoming message
 - Verify the bot message is an action payload
 - A call to conversation.postback() returns null if message is not an action
 - If an action message is found
 - Access payload (conversation.postback()) and check the state token

Example

Add token to payload

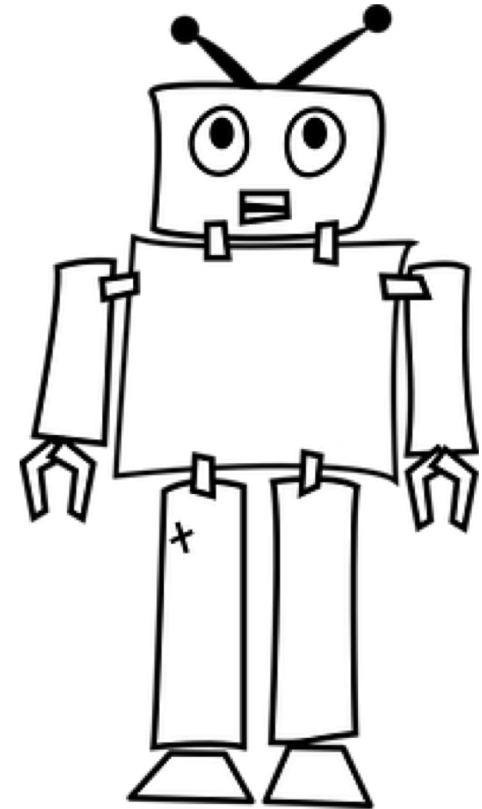
```
var _cancelLabel = "Cancel order";
var cancelAction = conversation.MessageModel().
    postbackActionObject(_cancelLabel, null, {
    "orderAction": "cancel",
    "orderId": _orderId,
    "statetoken": _token
});
```

Check message and token

```
const _token = "advt.24hrs.flowers-token-gHy45123cD2z"

//check if it is a postback request and state token mat
if (conversation.postback()
    && conversation.postback().statetoken == _token) {
    //is postback issued by this component
    let _action = conversation.postback().orderAction;
    if (_action == 'ok') {
        conversation.transition("NoChangeRequest");
        conversation.keepTurn(true);
        done();
    } else if (_action == 'cancel') {
```

Checking whether the message type is "action" is not enough. You must **verify the token** because other components may also send action messages.



Context variable token vs. payload token

Context variable

- Exists for duration of conversation
 - Allows state to be tracked beyond multiple custom component uses
- Suitable for complex state tracking and memorizing of values
- Variable cannot be deleted from custom component

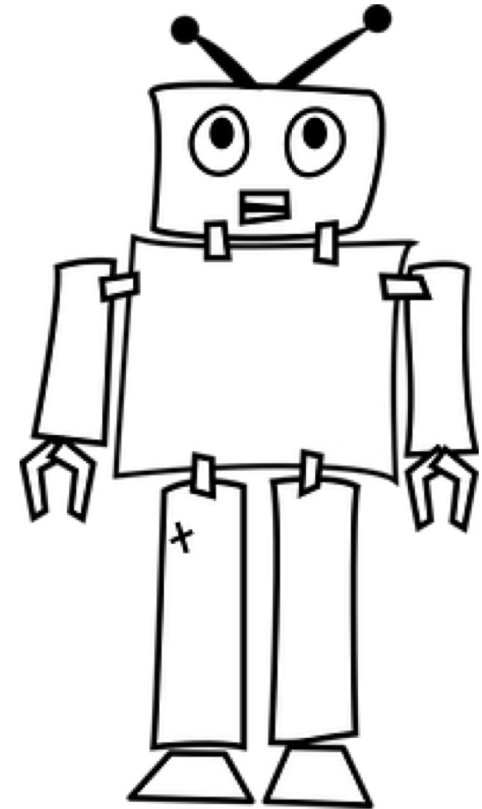
Payload

- One-time token
 - Not persisted in dialog flow
 - No 'housekeeping' required
- JSON string
 - Allows different token to be created for individual action items
- Lightweight

How to determine the type of a bot message

- `conversation.text()` returns text string or null
 - `If(conversation.text()) { ... handle text response ..}`
- `conversation.attachment()` returns attachment string or null
 - `If(conversation.attachment()) { ... handle attachment response ..}`
- `conversation.location()` returns location JSON object or null
 - `If(conversation.location()) { ... handle location response ..}`
- `conversation.postback()` returns postback JSON object or null
 - `If(conversation.postback()) { ... handle potsback response ..}`

A user who selects an item from a list of values or enters a list item name **sends an action message**. A user typing something that is not in the list sends a **text message**.

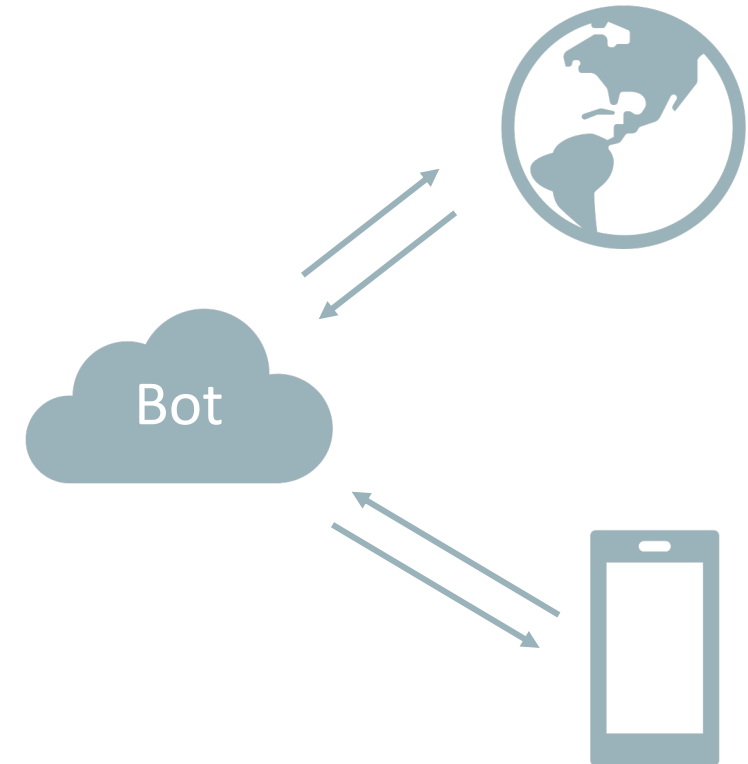


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Backend integration depends on deployment

- Local custom component container
 - Backend access coded in custom component
 - Use Node modules like 'request' and 'https'
- Oracle Mobile Hub
 - Service access through connectors
 - Access to connector through Mobile Hub SDK
- 3rd party node servers
 - Backend access coded in custom component
 - Supports environment variables

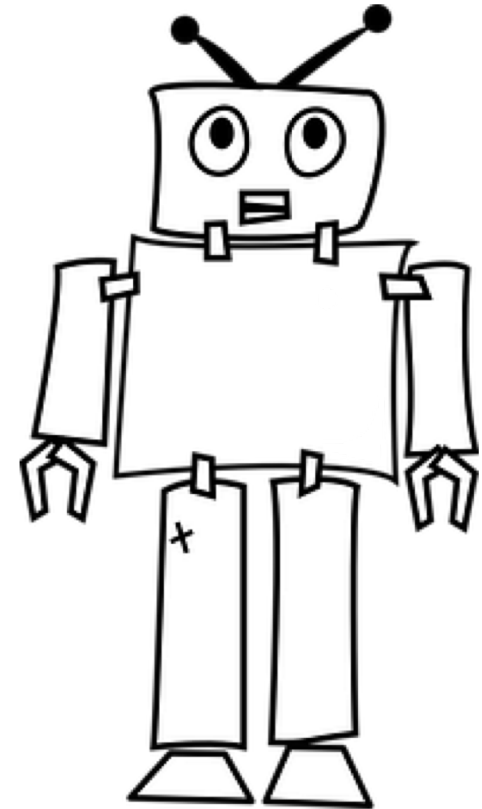


Backend integration with local component container

Accessing OpenWeatherMap using the Node request module

```
var request = require('request');  
...  
const host = 'api.openweathermap.org';  
const path = '/data/2.5/weather?q='+cityName+', '+countryCode+'&appid='+appKey;  
request('https://' + host + path, {json: true }, (err, res, body) => {  
  var weatherResponse = body; //access JSON payload with weather info  
  If (res.statusCode == 200) {  
    ...  
    conversation.transition('success');  
    done();  
  } else {  
    conversation.transition('error');  
    done();  
  }  
});
```

Before using the "request" module,
investigate other options too and
select the Node module that suites
your needs the best



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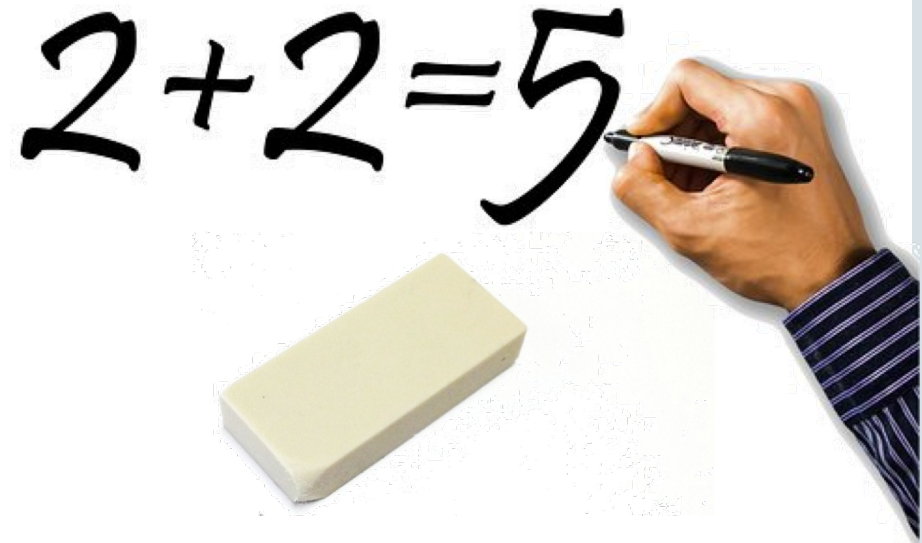
Possible custom component failures

- Operational
 - Backend access
 - Authentication & Authorization failure, Service unavailable
 - Application errors
 - Everything that prevents successful processing
 - JSON parsing errors, missing input parameter values
- Programming
 - Missing dependent files
 - Syntax problems



Error handling strategy

- Use action transitions for operational issues
 - Return action string that indicate the problem
 - Bot designers handle actions to states in dialog flow
- Use error transition for errors that cannot be handled by bot designer
 - Create a JS error object
 - Pass error object as argument to the done() callback call



Error handling responsibilities by persona

- Custom component designer
 - Defines transition action for errors that the bot designer can handle
 - Defines transition action for component success
 - Throws error for all exceptions a bot designer cannot handle
- Bot designer
 - Defines error transition on component state to handle exceptions
 - Defines action transitions for all errors he wants to handle
 - Defines a "next" transition to handle application errors the bot designer doesn't want to deal with

Example for error handling using action strings

Design time view in skill

+ Service

Filter

ErrorHandlingSample

<> sample.QueryOrderStatus

sample.QueryOrderStatus

Service ErrorHandlingSample

Properties

Property	Type	Required
orderNumber	string	true

Supported Actions

success

notAuthenticated

notAuthorized

invalidOrderNumber

applicationError

missingParameters

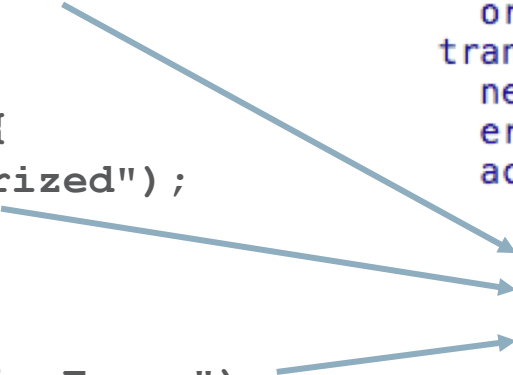
```
getOrderStatus:
  component: "sample.QueryOrderStatus"
  properties:
    orderNumber: "${orderNumber.value}"
  transitions:
    next: "handleOtherErrors"
    error: "handleSystemException"
  actions:
    success: "printOrderStatus"
    notAuthenticated: "authenticationError"
    notAuthorized: "authorizationError"
    applicationError: "applicationError"
```


Example for error handling using action strings

Custom component code

```
invoke: (conversation, done) => {
  //...
  if(errorType == 'authentication'){
    conversation.transition("notAuthenticated");
    done();
  }
  else if(errorType == 'authorization'){
    conversation.transition("notAuthorized");
    done();
  }
  else {
    conversation.transition("applicationError");
    done();
  }
  ...
}
```

```
getOrderStatus:
  component: "sample.QueryOrderStatus"
  properties:
    orderNumber: "${orderNumber.value}"
  transitions:
    next: "handleOtherErrors"
    error: "handleSystemException"
  actions:
    success: "printOrderStatus"
    notAuthenticated: "authenticationError"
    notAuthorized: "authorizationError"
    applicationError: "applicationError"
```



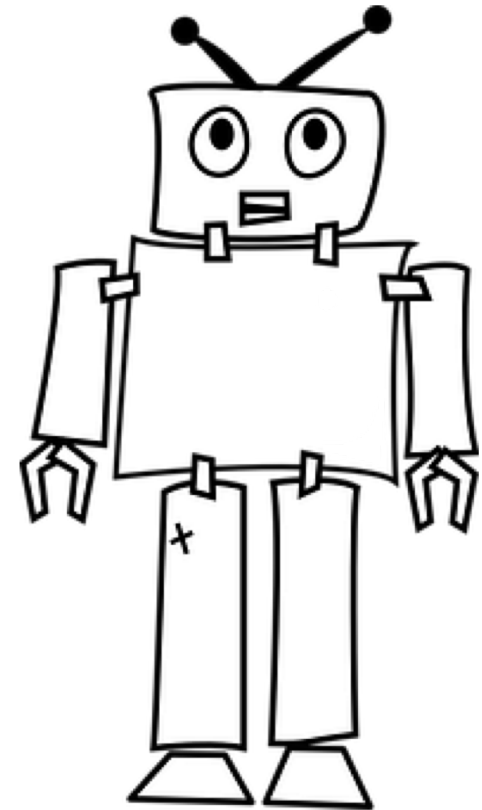
Using the error transition for errors that cannot be handled

- It may be that failures can be caught but not handled
 - Use error transition
- Error transition is invoked from custom component by passing an Error object as an argument to the done() callback
 - Error state name can be accessed in dialog flow using `${system.errorState}` expression
 - If there no error transition handler defined then the system error handler is used

```
if(errorType == 'exception'){  
    var err = new Error("Serious Exception ");  
    err.name = 'badRequest'; //optional  
    done(err);  
}
```

Elevator manufacturers have three ways of dealing with a fault: making an emergency call, applying the brakes and keeping people safe in the cabin, or dropping the cabin so that it quickly returns to a solid ground

Think about it next time before eagerly making a call to the error transition

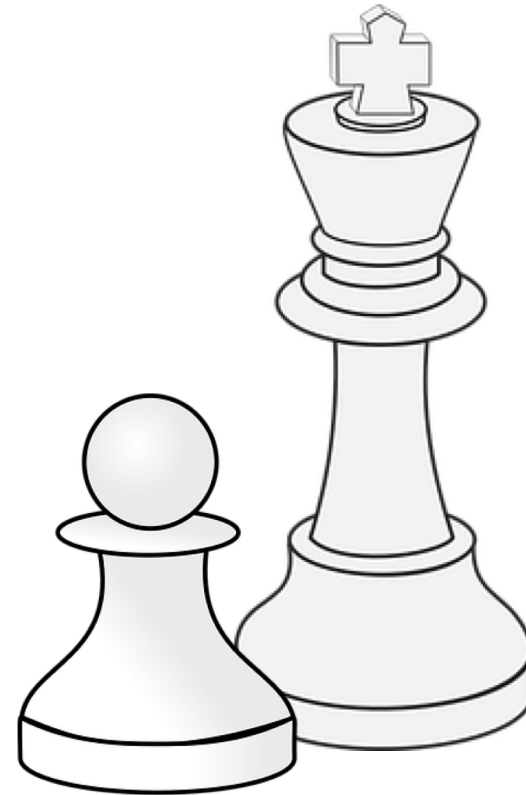


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Custom component response strategies

- Two Broad Strategies
 - Render Response to Messenger Client
 - Use Conversation Message Model
 - Handle complete task
 - Save Data in Context Variable
 - Render data using CRC component



Writing data to a context variable

- PRO

- Smaller response payload
- Data saved in context variable until variable is reset or dialog flow is exit
- Data can be auto-translated when displayed by system components
- Data can be used with message bundles

- CON

- No option available to describe the data structure to bot designers
 - Makes it hard to share the component
- Requires bot designer to know how to use the component
 - E.g. need to create context variable

Writing response to message channel

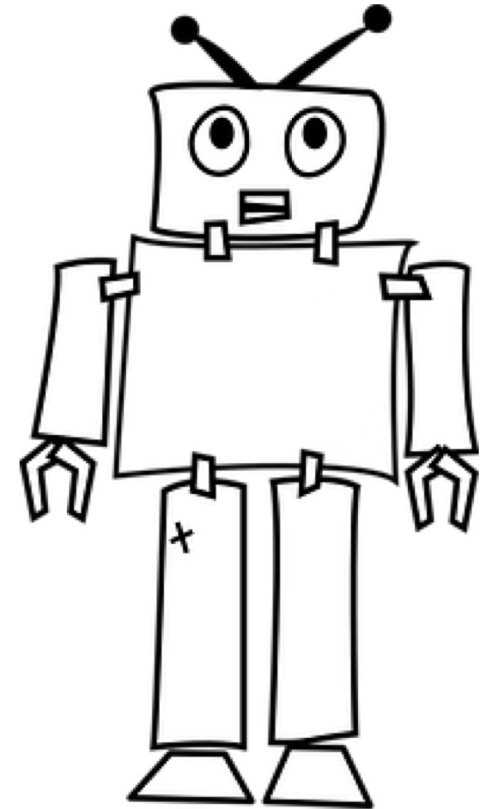
- PRO

- No need to document response data structure
- Custom component developers have full control over the rendered UI
- Component can be designed as "black box" for easy reuse

- CON

- Component response is more verbose compared to when just sending data
- Data objects cannot be cached
 - Information needs to be re-queried if needed more often
- Multi-language translation must be handled by the component

Be Mindful when saving data in context variables. **A bot is not a database**



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CR component features missing for custom components

Features you would have to code for

- Composite bot responses
- Composite bag entity support
- Entity validation
- Page ranging
- Entity slotting
 - variable
 - nlpResultVariable
- Auto translation

When to use the CR component

- Whenever possible
- Reduces risk of code changes due to SDK changes
- Use with data saved in context variables
 - Data in context variables is cached for a conversation
 - Can be used more than once
 - Has a smaller payload when passed to the bot

When to render the UI from a custom component

- When the custom component is a "closed" system
 - Handling of a complete a task
- When a component needs to go into longer "user interactions"
 - E.g. in a questionair
- When a component should be reused across bots
 - Avoiding dialog flow dependencies

Integrated Cloud

Applications & Platform Services

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Oracle Digital Assistant Hands-On

TBD