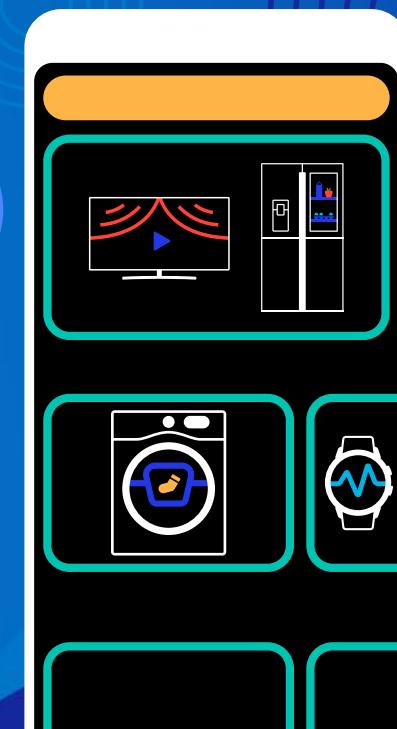


# Bixby for Voice Developers

Roger Kibbe  
Senior Developer Evangelist  
Viv Labs / Samsung  
@rogerkibbe



# What Is Bixby?

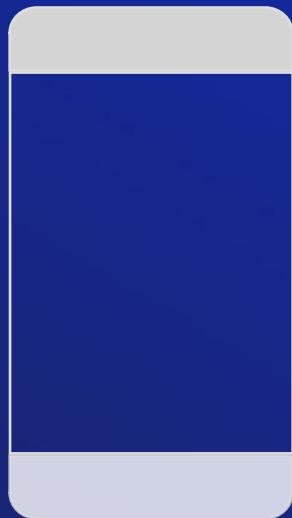
- Samsung's Voice/Conversational AI assistant
- Bixby 2 introduced last November – based on Viv Labs Technology
- Viv Labs – Acquired by Samsung 2 years ago
- Story starts with Siri
  - Dag Kittlaus and Adam Cheyer founded Siri
  - Sold to Apple - worked there for a couple years
  - Left to create a next generation conversational AI platform and founded Viv Labs
  - Samsung bought Viv Labs in late 2016

# Bixby Reach

- #1 in Smartphones
- #1 in Televisions
- #1 in US Appliances
- 70% of US Households have a Samsung device
- Significant market share in portable speakers/automotive via Harman
- Bixby coming to all of the above and more . . .

# Bixby Reach

500 Million Bixby Enabled  
Devices per Year



Bixby

# Bixby Development

# Bixby Development – Model Driven

- Bixby is a declarative, model driven development paradigm vs Imperative, code first development
- The model handles the “plumbing”
- And provides consistency – VUX standards
- Developer focuses time, energy and creativity on the business logic – what differentiates your capsule (voice app or “skill” in Bixby terminology)

# Bixby Development - AI Driven

- Bixby models are “compiled” into programs on the fly – Dynamic program generation
- Model and Dynamic program generation handle
  - NLU (Natural language understanding)
  - Required and optional inputs, computed inputs and eliciting input from user.
  - Flows
  - Output variables, speech and UI layout
  - Errors, retries and related user messaging
- A fraction of typical code is written for a Bixby Capsule

# Bixby Dev - Dynamic Program Generation

Simulator — Bixby Studio

Debug Console — Bixby Studio

example.spaceResorts  
bixby-mobile-en-US

Run NL

To use voice commands, hold down the spacebar or  
mic icon while speaking.

Bixby Simulator

Enter an utterance in the control panel

Nothing to debug. Run a query in the Simulator first.

Open Simulator

# Bixby Dev -Contextually Aware/Personalization

- Bixby has contextual awareness
  - Understand the conversation
  - Smart continuations
- Powerful personalization capabilities
  - Preference Learning: Remember my preferences based on behavior and context
  - Selection learning: Learn selections made by the user/all users – contextually aware
- All model driven – no code required

# Bixby Dev - Multimodal

- Voice only apps are very good
- Multi-modal = the frosting on the cake
- Built in multi-modal capabilities – not add on
- Bixby Views – UI framework that scales - Watches to TV's

# Bixby Dev - Level Playing Field

- Bixby Developer Tools –  
[www.bixbydevelopers.com](http://www.bixbydevelopers.com)
- Same tools used internally
- No special access/tools internally
- Level playing field – a big differentiator

# How to Start Developing for Bixby



# Bixby Development - Model Example

```
action (getUserInfo) {  
    type (Search)  
    description (Get user info for capsule)  
    collect {  
        input (firstName) {  
            type (contact.FirstName)  
            min (Required) max (One)  
        }  
        input (lastName) {  
            type (contact.LastName)  
            min (Optional) max (One)  
        }  
        input (birthday) {  
            type(contact.BirthdayInfo)  
            min (Required) max (One)  
        }  
    }  
    output (User)
```

Action (method, intent) that:

- Requires: firstName and birthday
- Optional: lastName

Natural language training utterances pick up  
input / UI forms or both

Bixby NLU get data from the utterance and elicit  
missing required input automatically – via voice /  
UI forms or both

# Sample Capsule - States & Capitals

*Question:*

What is the capital  
of California?

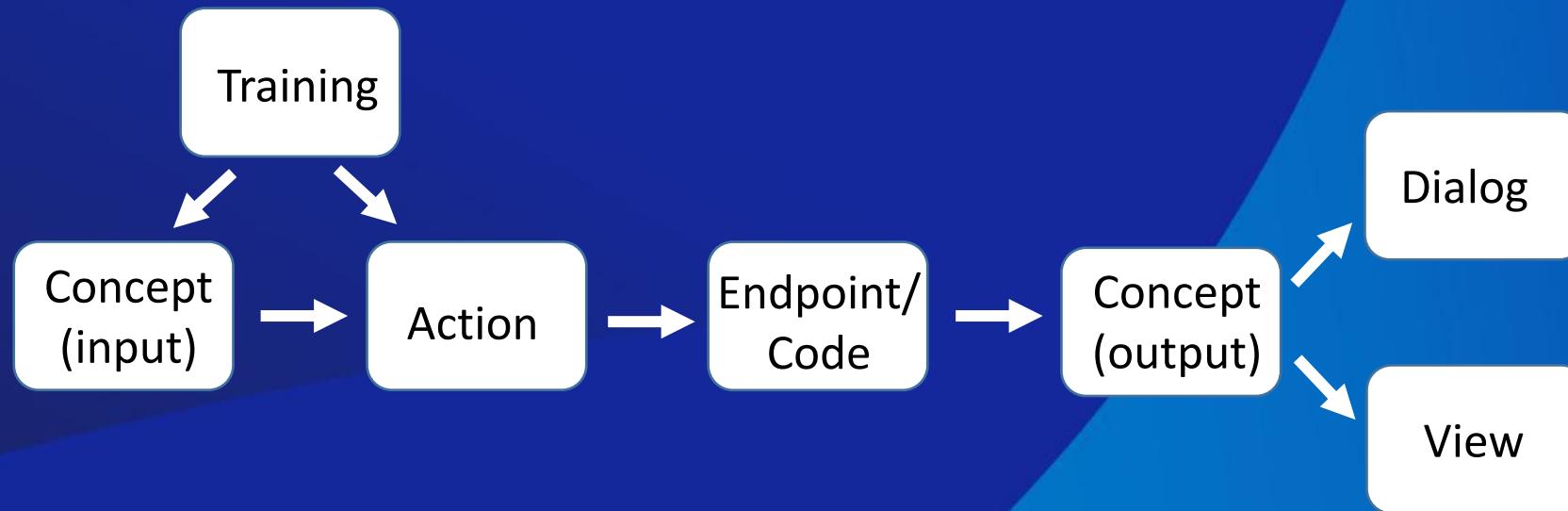
*Answer:*

The capital of California  
is Sacramento



Code on Github: <https://github.com/bixbydevelopers/capsule-sample-states-and-capitals>

# Bixby Development - Components



# Input Concepts and Actions

What is the capital of California?

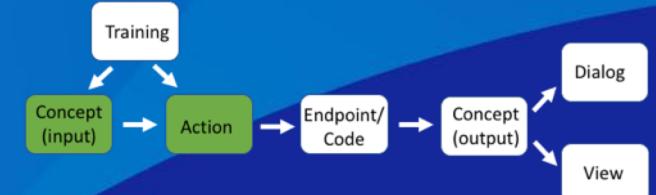
*Action:*  
Find Capital  
*The verb or  
the method*

Equivalent: Intent



*Concept:*  
The State e.g. California  
*The noun or the  
variable*

Equivalent: Slot



# Output Concepts

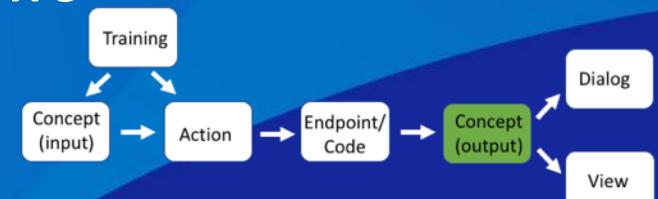
Sacramento



*Concepts:*  
Capital  
State Graphic

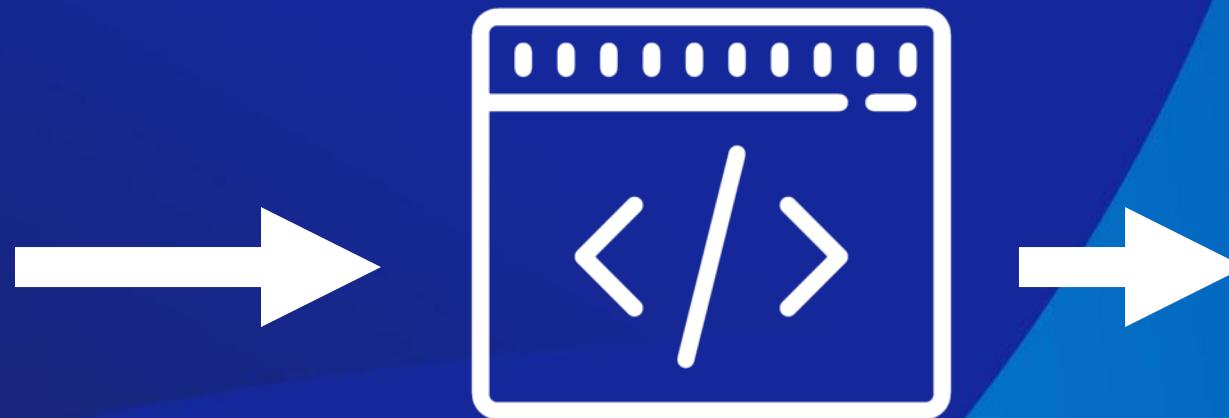


*Structured Concept:*  
*Object with both Capital and State Graphic*



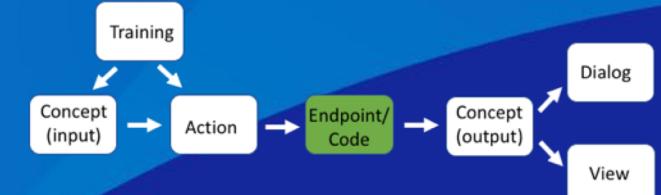
# Business Logic: Endpoints and Code

*Action:*  
Find Capitals



*Endpoint:* *Code:*  
*Ties Action*  
*to Code*      *Business logic*  
                    CapitalLookup.js

Equivalent: Lambda, Webhook, Cloud Function



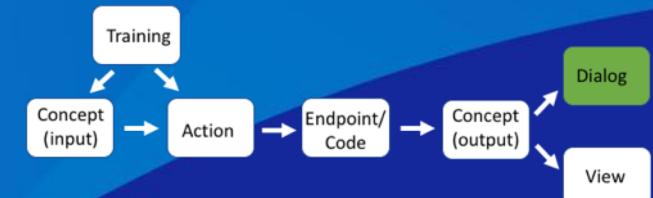
# Dialog

The capital of California is Sacramento

*Dialog:  
The answer on  
screen and  
spoken*

Equivalent: request.speak, speech

*Concepts*

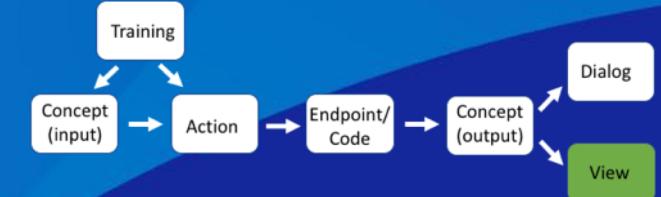


# View (UI)



*View:*  
State Graphic

Equivalent: APL, Card, Rich Response

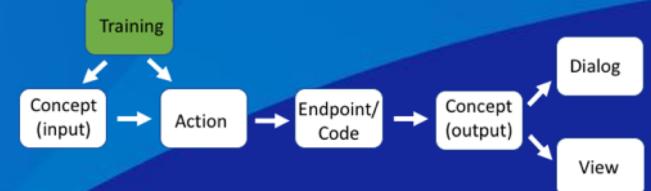


# Natural Language Training

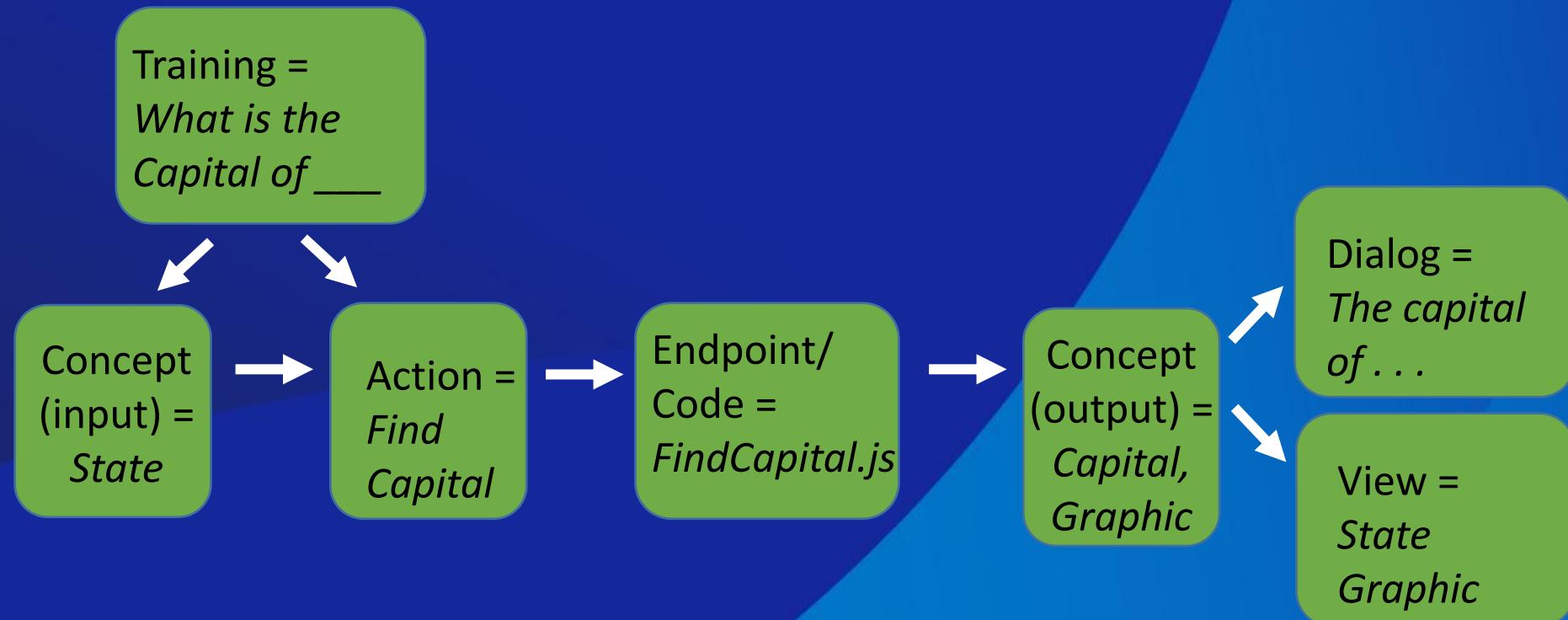
“What is the capital of \_\_\_\_\_” =

*Training:*  
NLU (Natural  
Language  
understanding)

Equivalent: Utterances, Training Phrases



# Review: Components of a Bixby Capsule



# Bixby Development - IDE

- [www.bixbydevelopers.com](http://www.bixbydevelopers.com)
- Bixby Developer Studio IDE - Single IDE for all Bixby development
  - Modeling
  - Code (JavaScript)
  - NLU Modeling
  - Simulator
  - Debugger
  - Unit Testing

# Bixby Development - Tutorials & Sample Code

- Start with Dice sample capsule – Quick Start Guide  
[bixbydevelopers.com](http://bixbydevelopers.com)
- Watch the Bixby 101 and Coding with Adam videos  
[bit.ly/BixbyVideos](http://bit.ly/BixbyVideos)
- Github – [github.com/bixbydevelopers](http://github.com/bixbydevelopers)

# Bixby Development Fact Capsule

- Simple capsule for facts or jokes
- Start with copy and paste – use spreadsheet to create content
- Example API Call
- Customize with NLU training and tags (search terms)

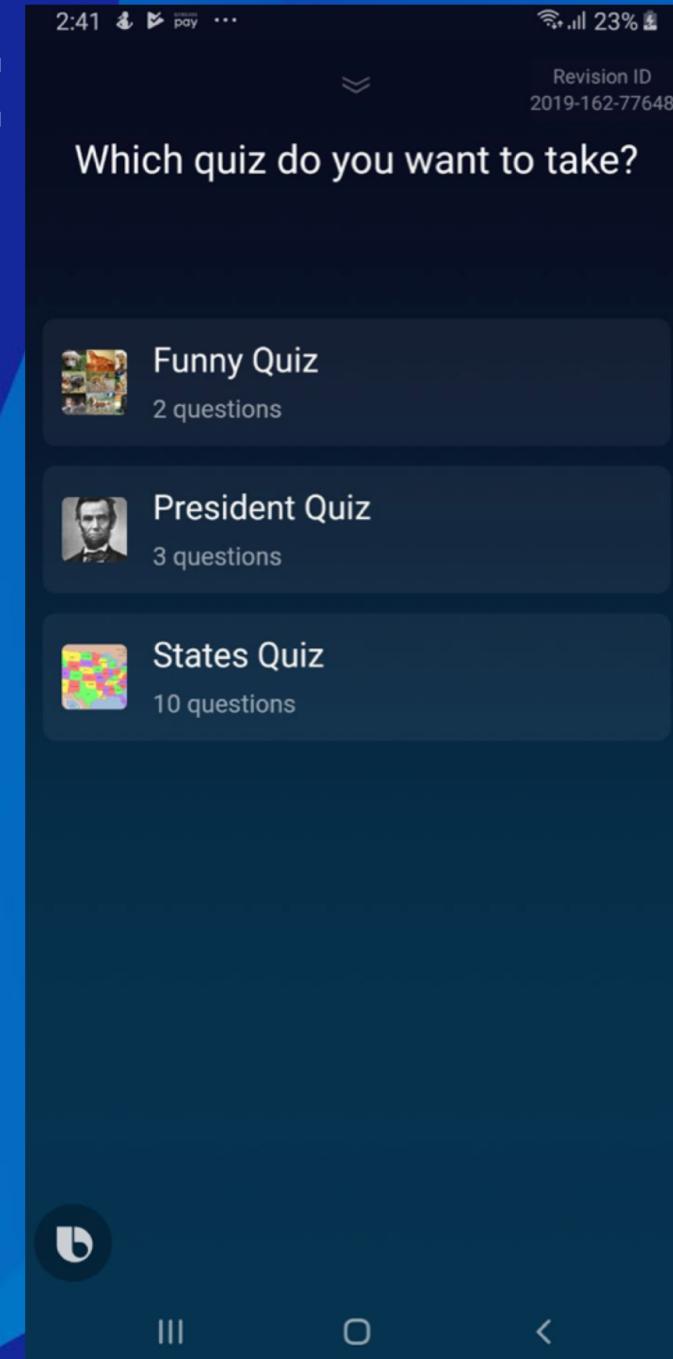
<https://github.com/bixbydevelopers/capsule-sample-fact>



# Bixby Development Quiz Capsule

- Simple capsule – simple quiz
- Start with copy and paste – use spreadsheet to create content
- Customize

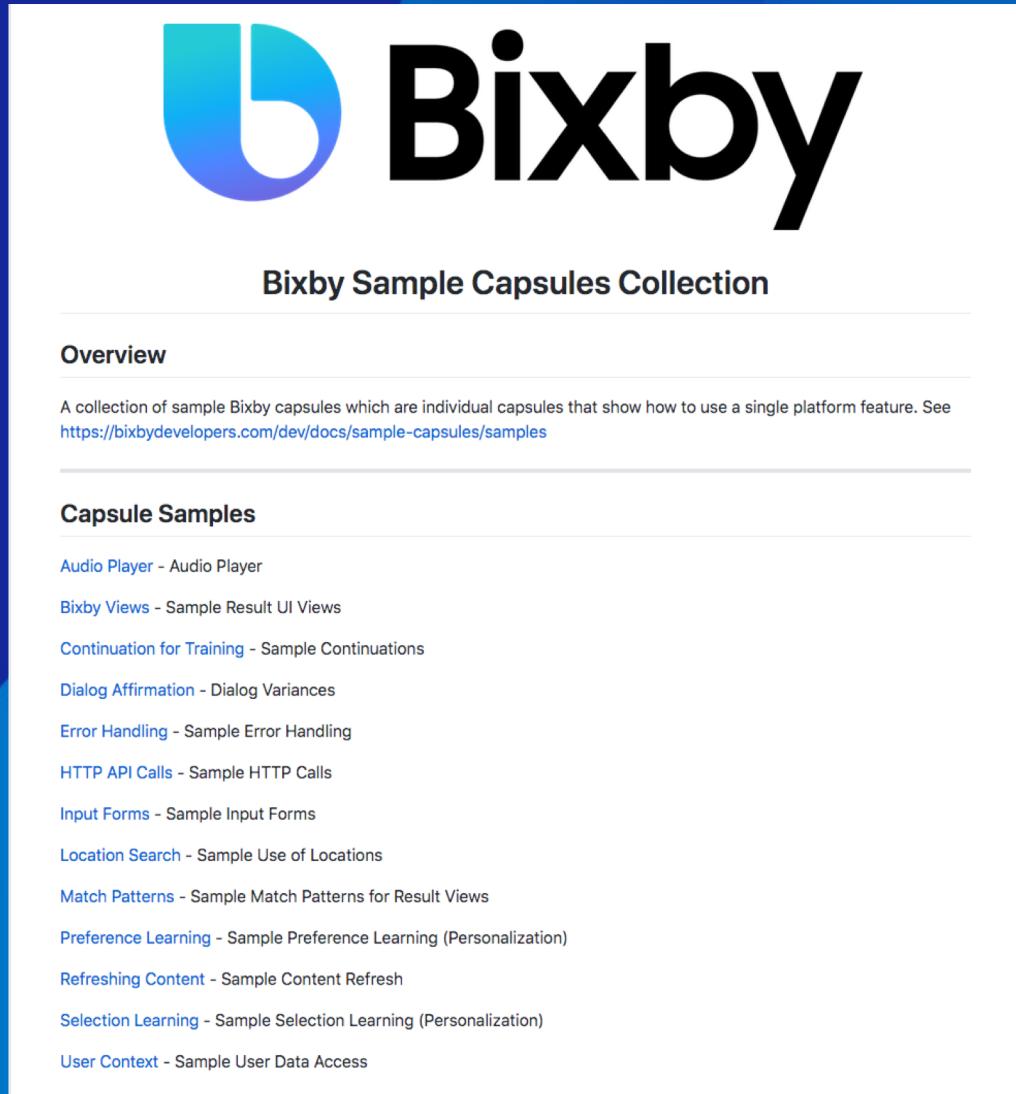
<https://github.com/bixbydevelopers/capsule-sample-quiz>



# Bixby Development - Sample Capsules

- Cookbook of sample capsules
- Learn concepts
- Augment the documentation

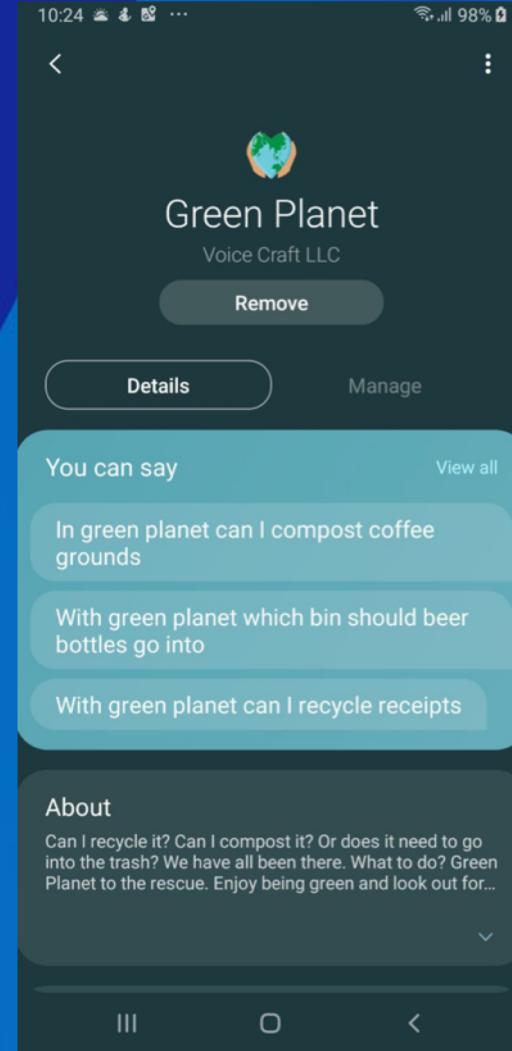
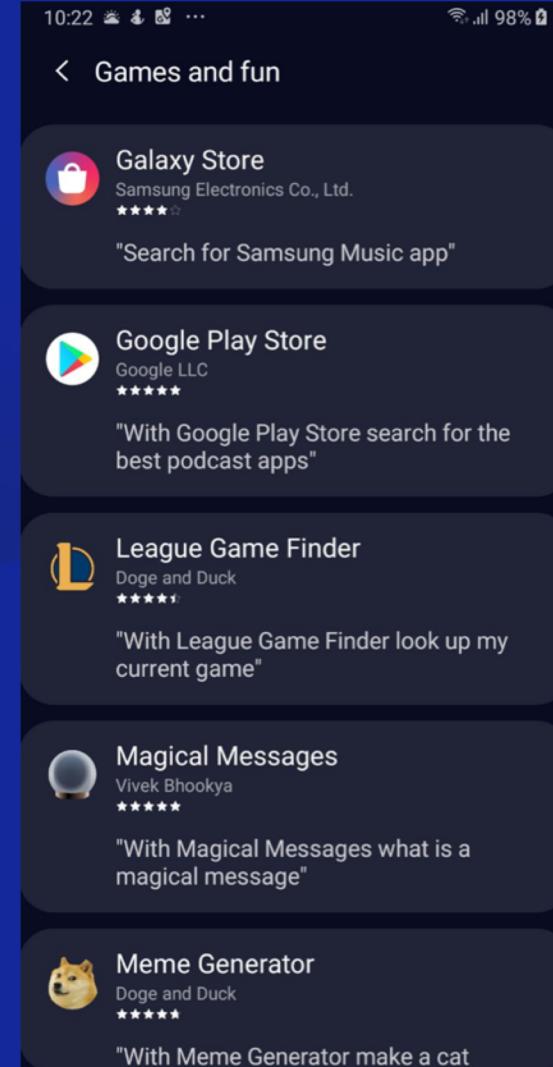
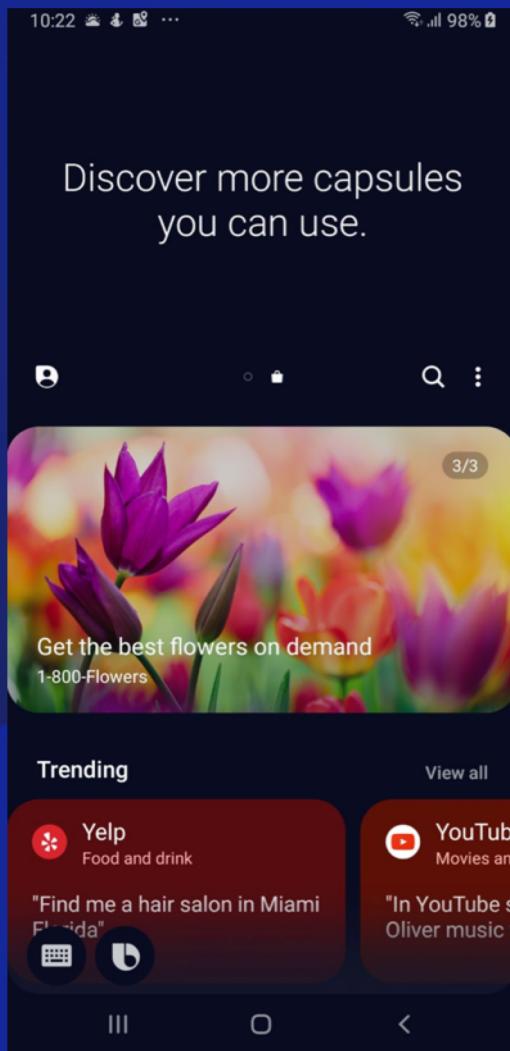
[https://github.com/bixbydevelopers/  
capsule-samples-collection](https://github.com/bixbydevelopers/capsule-samples-collection)



The screenshot shows the 'Bixby Sample Capsules Collection' page. At the top is the Bixby logo, followed by the title 'Bixby Sample Capsules Collection'. Below the title is a section titled 'Overview' with a brief description of the collection. The main content is a list of 'Capsule Samples' with links to their respective documentation pages.

Capsule Sample	Description
<a href="#">Audio Player</a> - Audio Player	
<a href="#">Bixby Views</a> - Sample Result UI Views	
<a href="#">Continuation for Training</a> - Sample Continuations	
<a href="#">Dialog Affirmation</a> - Dialog Variances	
<a href="#">Error Handling</a> - Sample Error Handling	
<a href="#">HTTP API Calls</a> - Sample HTTP Calls	
<a href="#">Input Forms</a> - Sample Input Forms	
<a href="#">Location Search</a> - Sample Use of Locations	
<a href="#">Match Patterns</a> - Sample Match Patterns for Result Views	
<a href="#">Preference Learning</a> - Sample Preference Learning (Personalization)	
<a href="#">Refreshing Content</a> - Sample Content Refresh	
<a href="#">Selection Learning</a> - Sample Selection Learning (Personalization)	
<a href="#">User Context</a> - Sample User Data Access	

# Bixby Marketplace



 **Bixby**

# Bixby Marketplace

- Conceptually Similar to other Voice App Stores/App Stores
- Refine and polish capsule till ready and then submit
- Metadata e.g. icon, description, categories etc. shown in marketplace
- Tips
  - Multimodal – Great graphics
  - Dispatch name and phrases work well
  - First mover opportunity

# Bixby Premier Developer

- Partner Program
- Partners have had success in other voice platforms
- Port your experience to Bixby and take advantage of the unique Bixby features
- White glove support
- Loaner Devices
- Adam Cheyer's insight on building a voice/AI startup

<http://bixby.partners>



# Thank you & Questions

Presentation: [bit.ly/bixbyVoice19](https://bit.ly/bixbyVoice19)

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