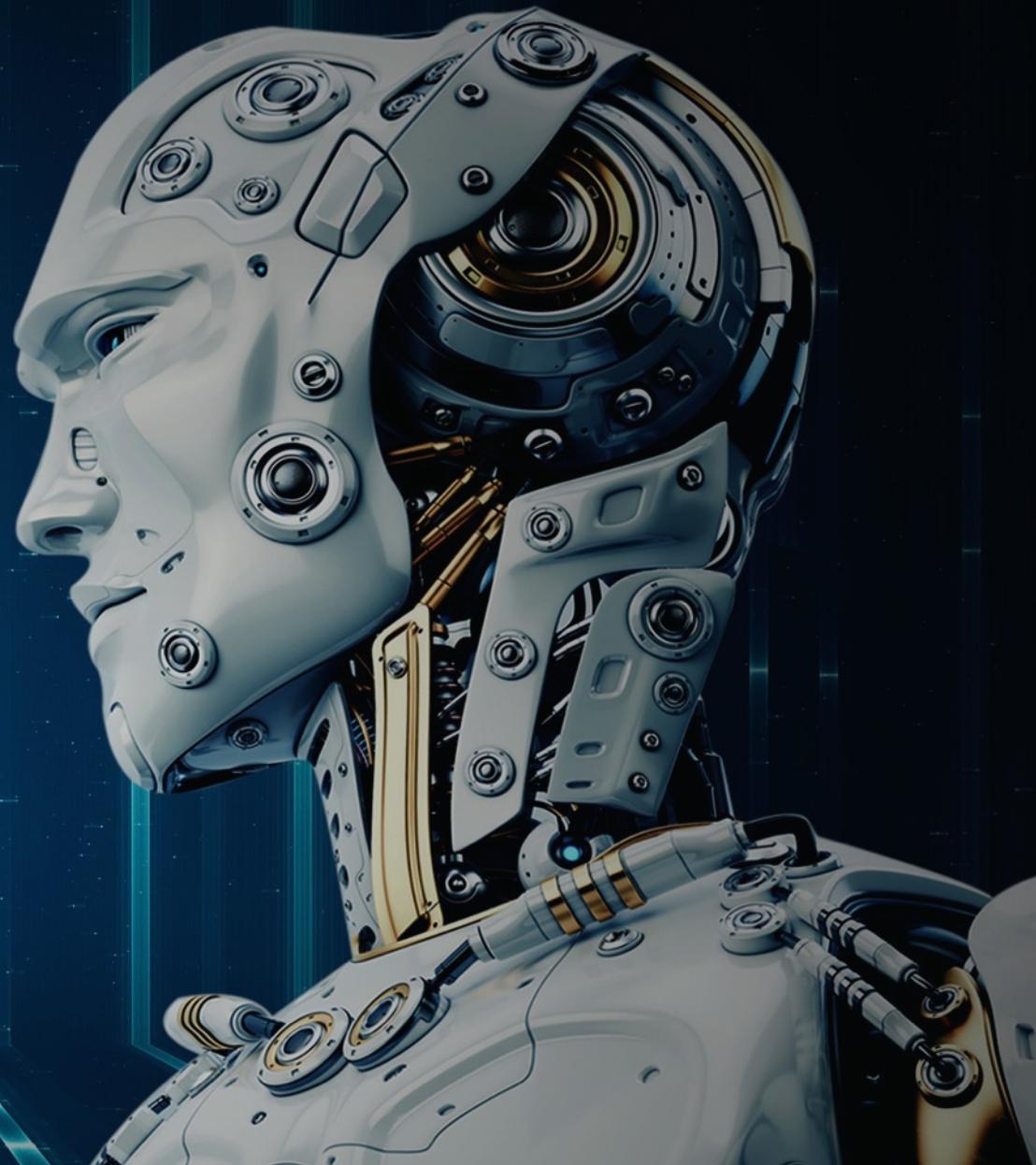


ORACLE®

Oracle Intelligent Bots

Advanced Training

Guidelines for training your bot



Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

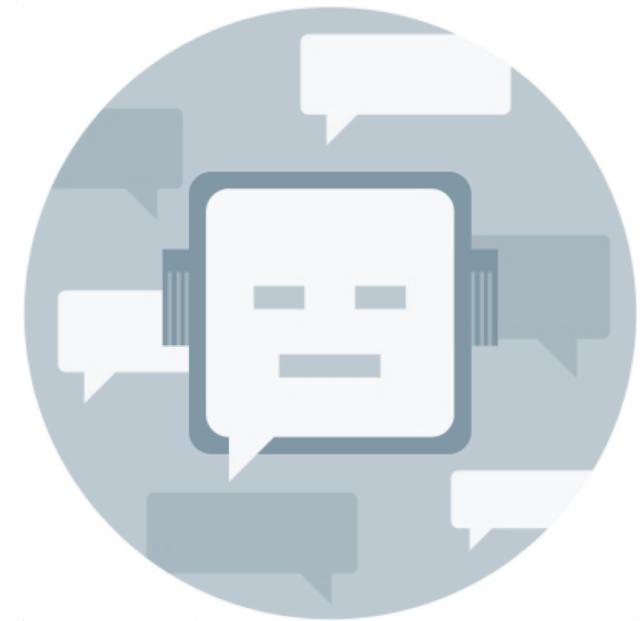
Topic Agenda

- 1 ➤ Recap – the models in Oracle Intelligent Bots
- 2 ➤ General guidelines for training your bot
- 3 ➤ Specific tips for training your bot
- 4 ➤ Quality reports
- 5 ➤ Q & A

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Your chatbot is only as smart as the
data you train it with.



Why have different training models?

- Trainer Ht (Sakura)
 - Rules based
 - Fast & best suited for small set of utterances
 - Good for new development
- Trainer Tm (Tamao)
 - Machine learning
 - Thrives on more and more data
 - Higher accuracy (especially data outside your utterances) if enough data
 - Already trained on “knowledge” of English language (NLP)
- Q&A

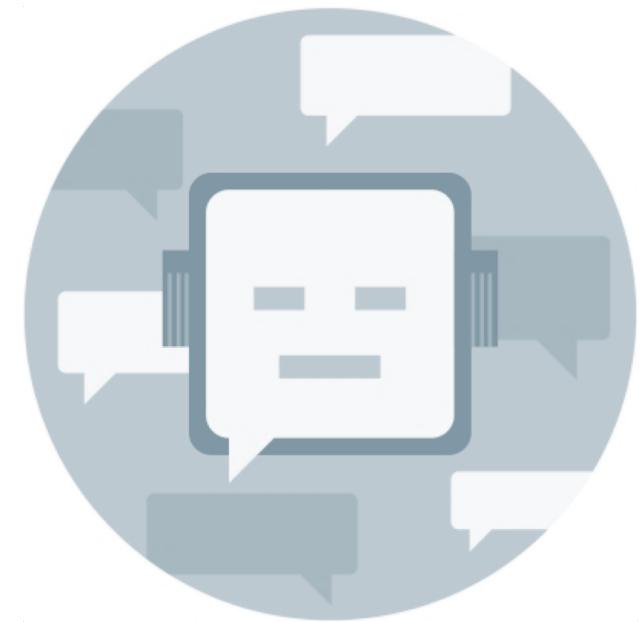
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General principles for training your bot

- The more unmodified real-world sample utterances, the better
 - Alternatively, you need enough data to get the quality/performance you require
- You don't necessarily have to sanitize user data
 - Include common mis-spellings, slang, synonyms, abbreviations
- But sometimes you have to start somewhere
- Train, test, repeat
 - Use batch training feature
 - For all new data perform a 80/20 split: training data, testing data

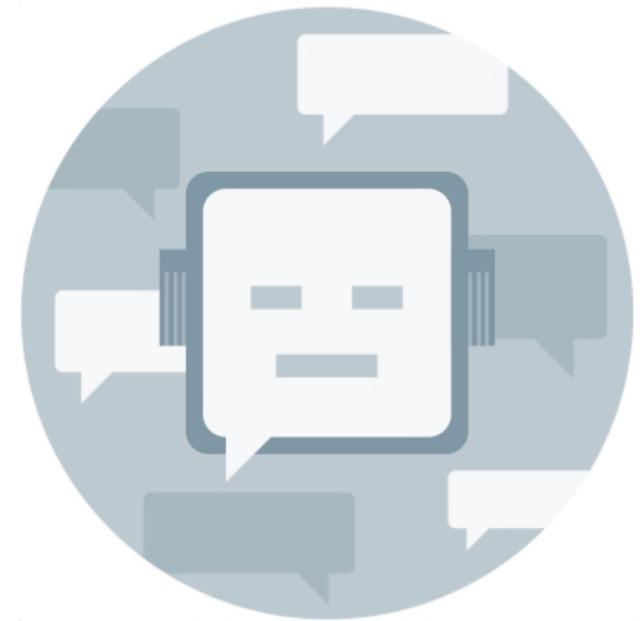
But what do you do if you don't have any real world data? **You have to synthesize utterances.**



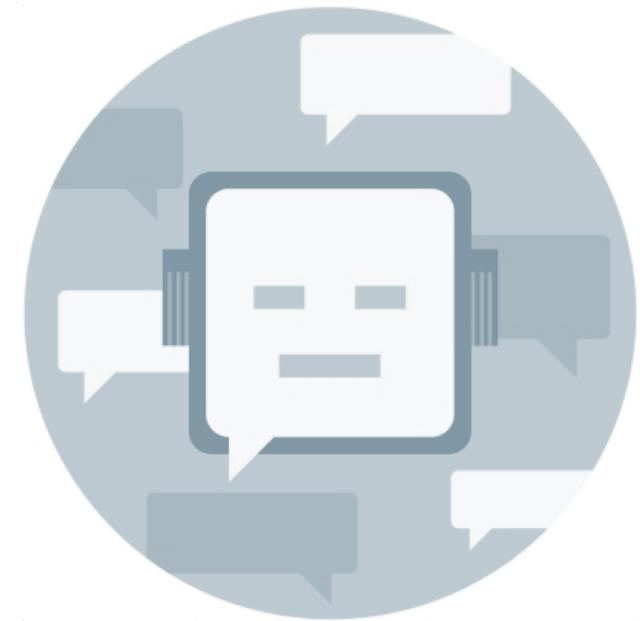
Synthesizing utterances when you have no existing data

- Trainer Ht generally better with smaller data sets
 - Consider moving to Trainer Tm as you gather more sample user inputs
- You have to synthesize sample utterance
 - Your primary goal is to help disambiguate intents
- There is no inherent knowledge of what an utterance actually means
 - Frequency of words
 - Sentence patterns
 - Some knowledge of parts of speech
 - Train with synonyms
- Train, test, repeat

So if I am going to build a good model shouldn't I know how it works?



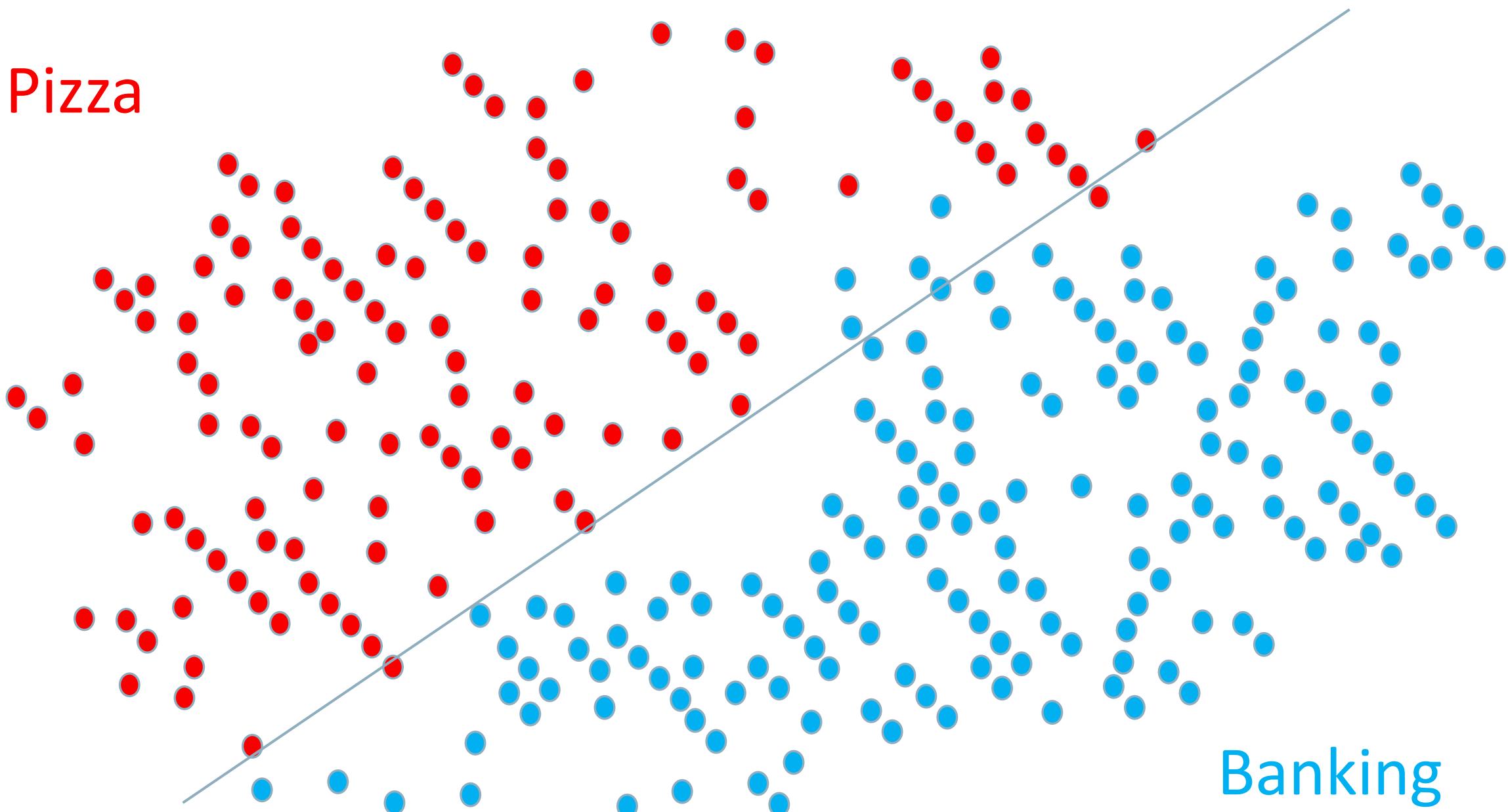
Here is the big picture



Pizza

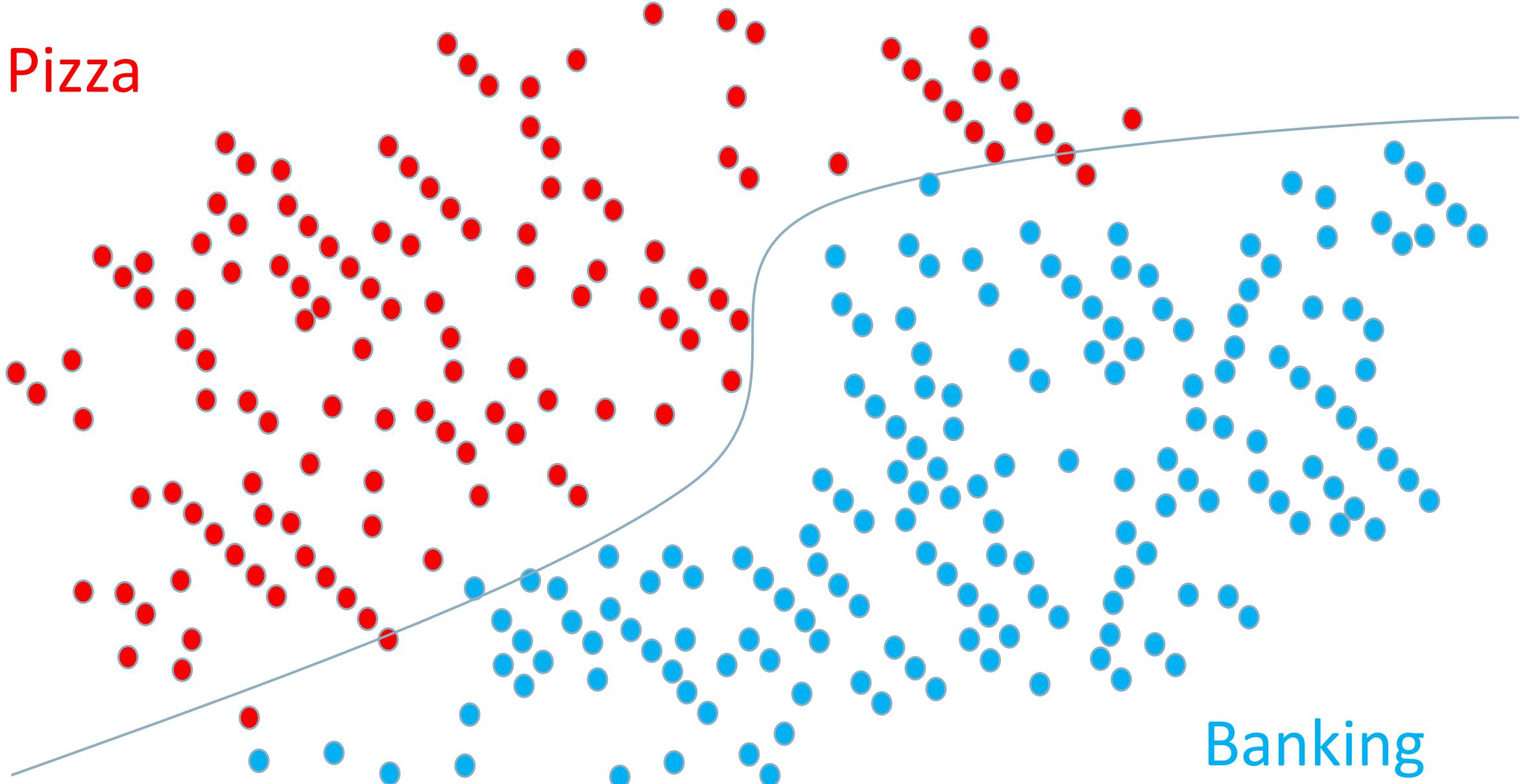


Pizza

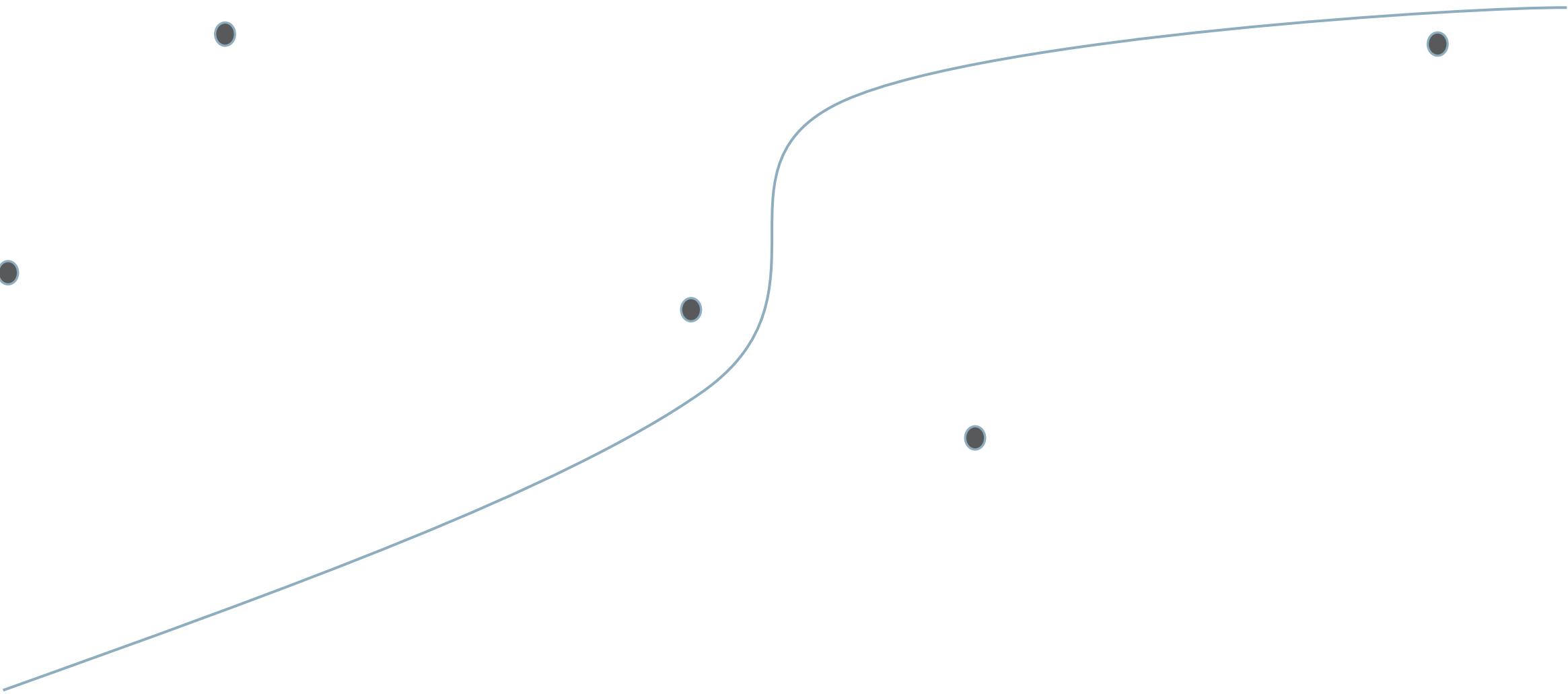


Banking

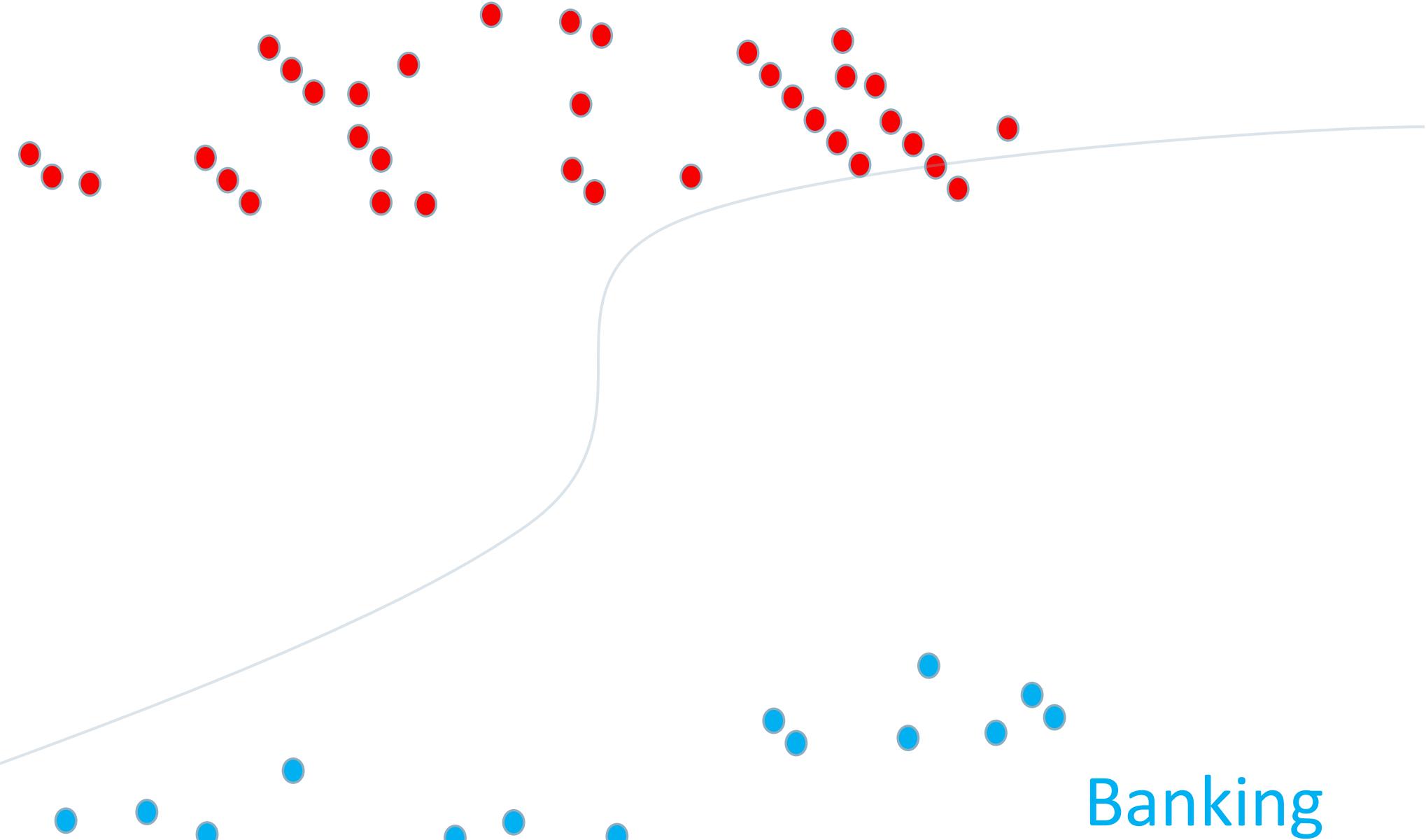
Pizza



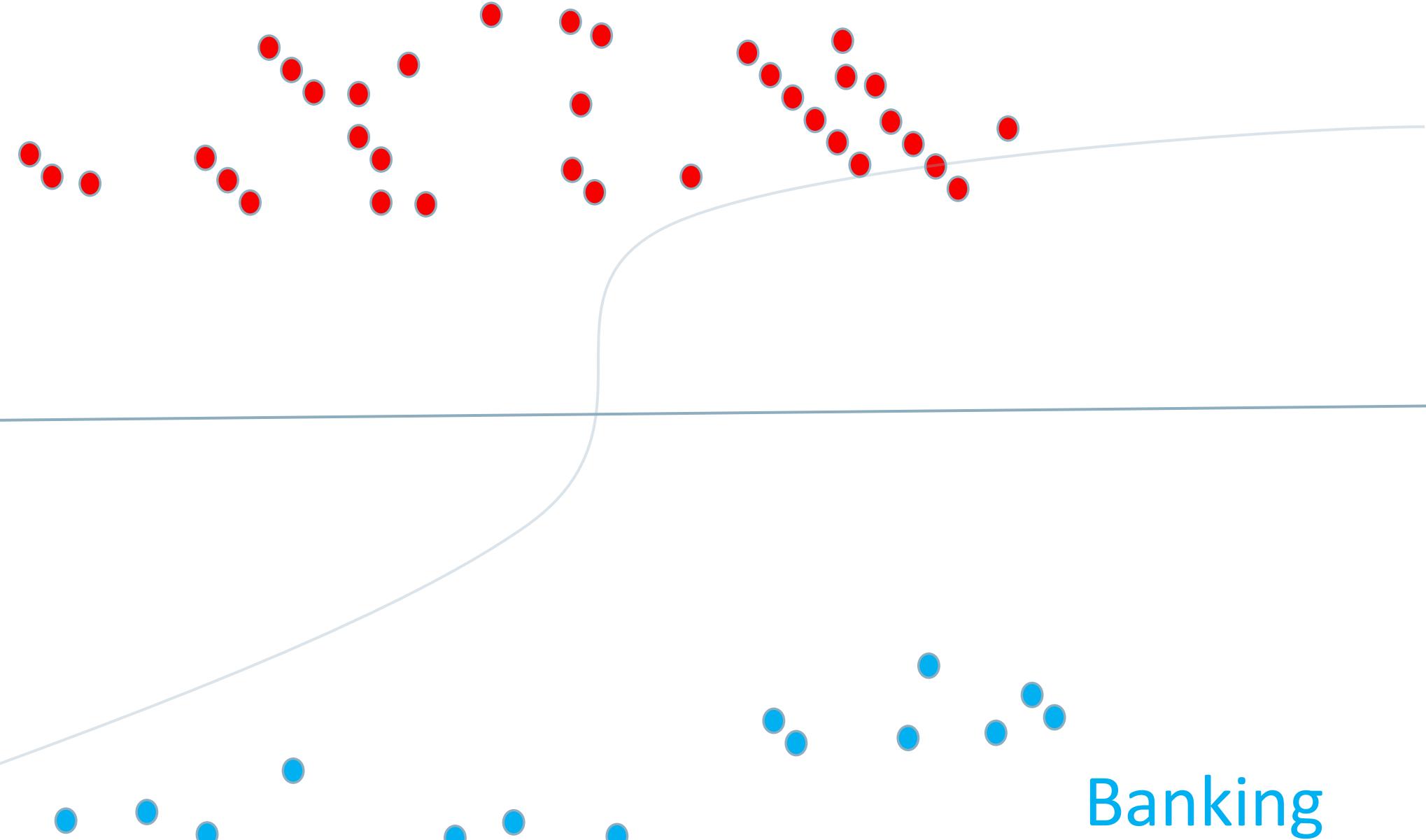
Pizza



Pizza

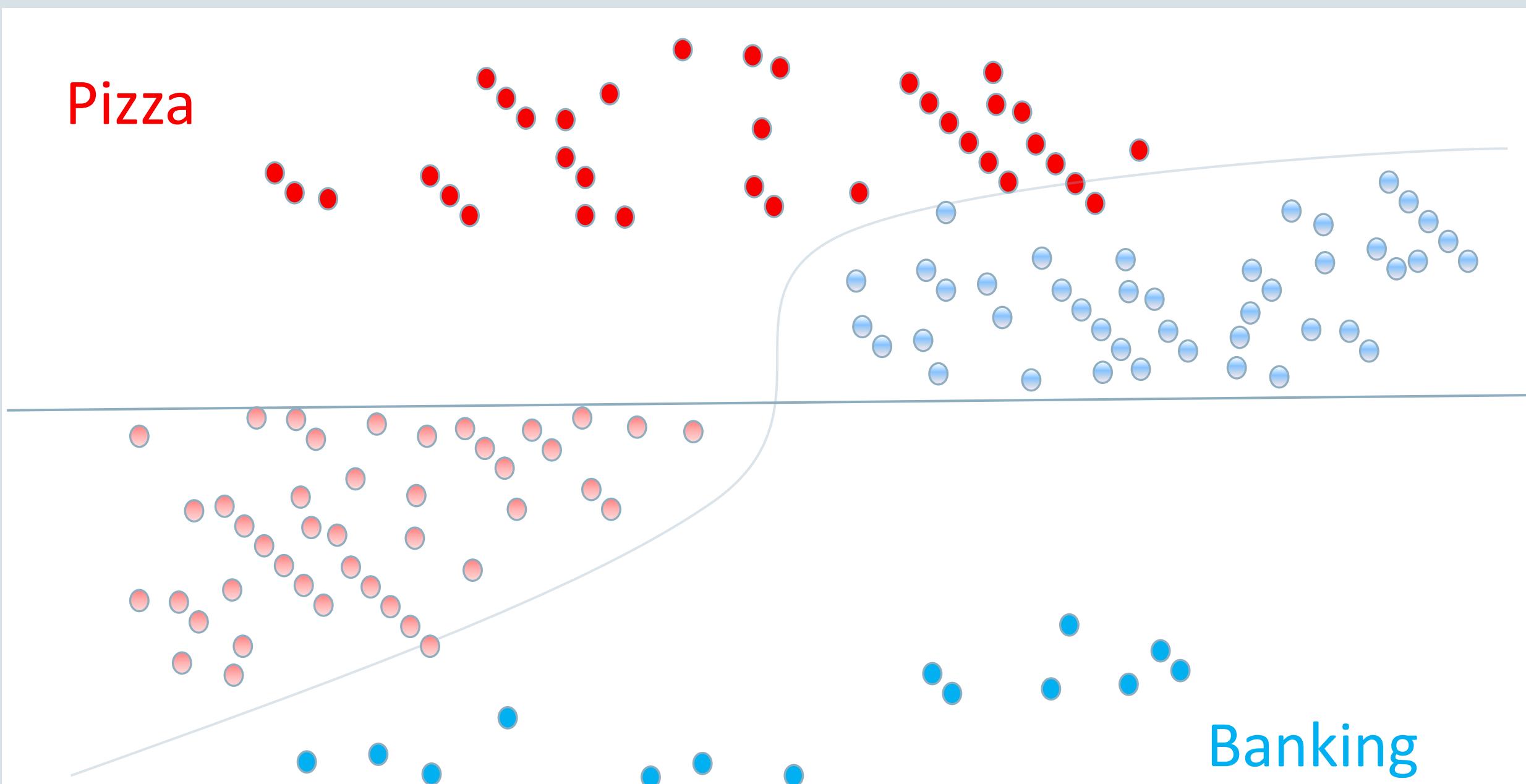


Pizza

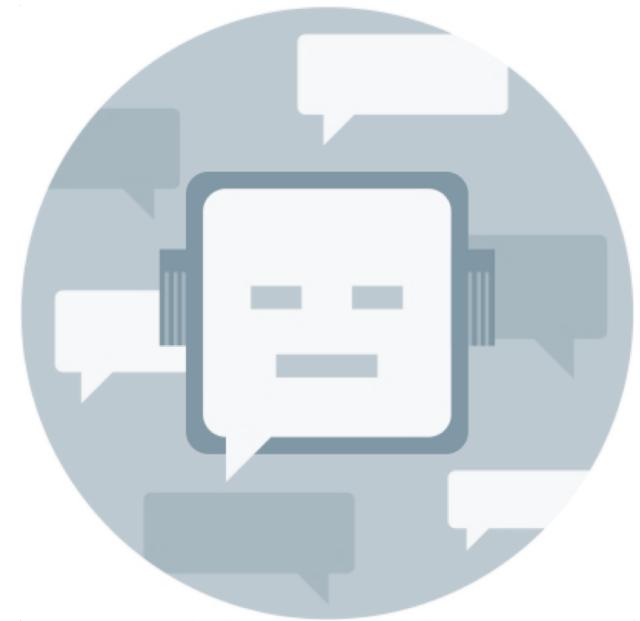


Pizza

Banking

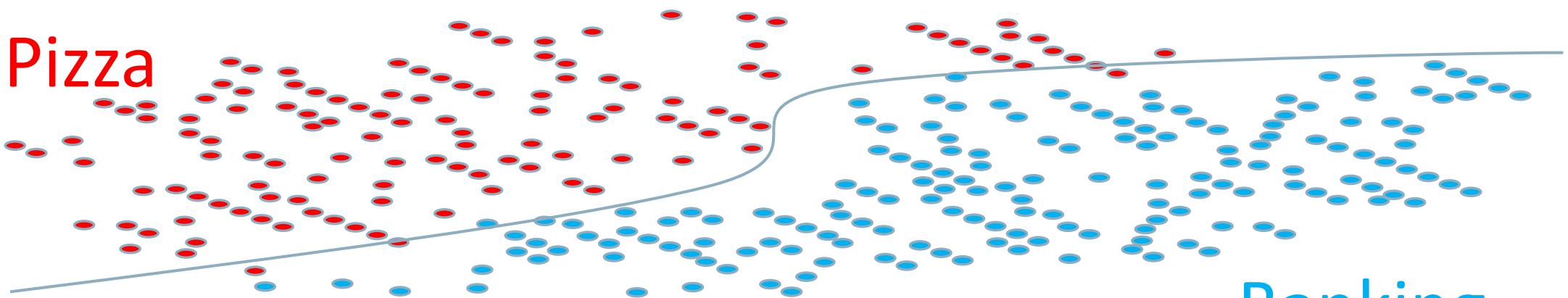


If your bot is only trained to know about two possible intents, then it will try to resolve any input to one of those intent

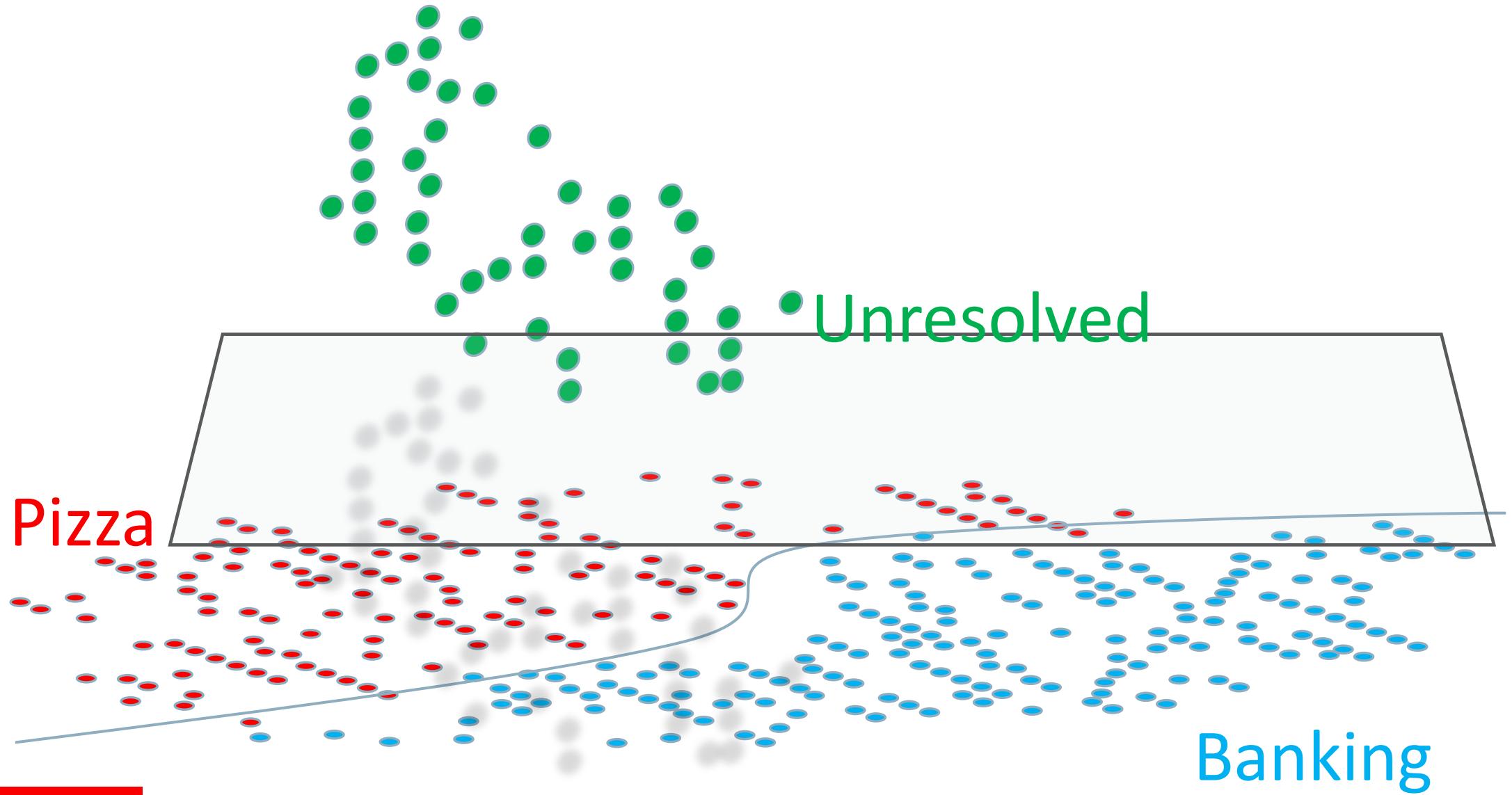


Pizza

Banking







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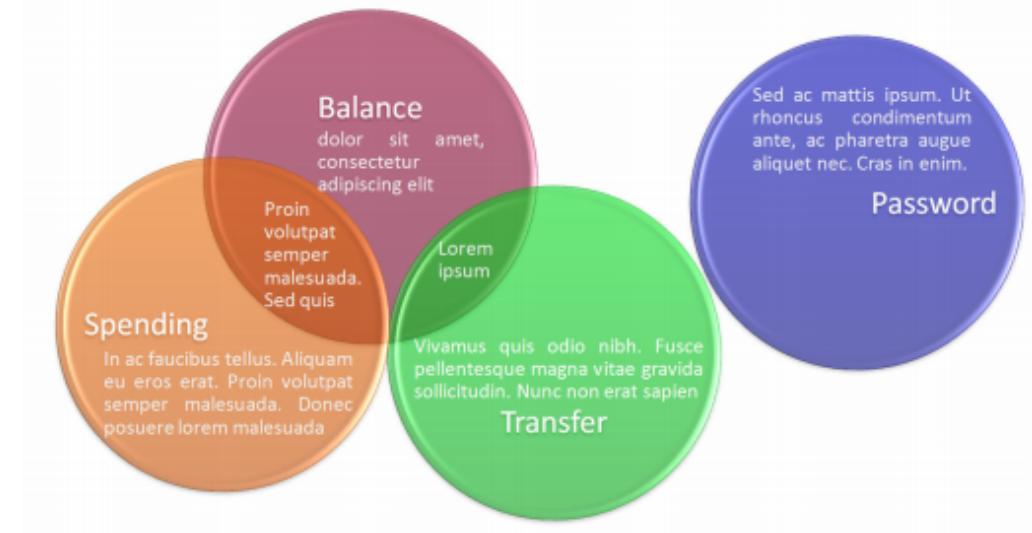


Understand what
makes an intent unique



Understand what makes an intent unique

- The goal is to disambiguate intents
- What are key actors, actions and objects
 - “who” does “what” to “who”
 - Design utterances around these
- Consider combining intents if too similar
 - E.g. Separate intents for home, travel, car insurance





Weight utterances to emphasize differentiating phrases



Weight utterances with key phrases or words

- Trainer Ht bases probability on occurrence of words in input vs sample utterances
- Weight utterances with differentiating phrases
 - Deliberately “skews” the model
 - E.g. If one intent only deals with “no claims protection” add
 - “no claims protection”
 - “protected no claims”
 - “no claims bonus”
 - Add as short phrases rather than full sentences
- Always retest to see the impact of changes



Image courtesy of Kittisak at FreeDigitalPhotos.net



Where you see commonality in utterances, consider combining intents



Consider combining intents

- More commonality of terms between intent utterances, the more difficult to disambiguate intents
- Consider creating one common intent and use entities to understand the discriminating factors

Updating Policy to add new person

Updating Policy to protect no claims



Add wife to my policy

Alter my insurance to add son

Can I change my policy to include spouse

Add my wife to insurance

Alter my policy to add wife

Update policy to include son

Add no claims to my policy

Alter my insurance to add protection

Can I change my policy to protect NCB

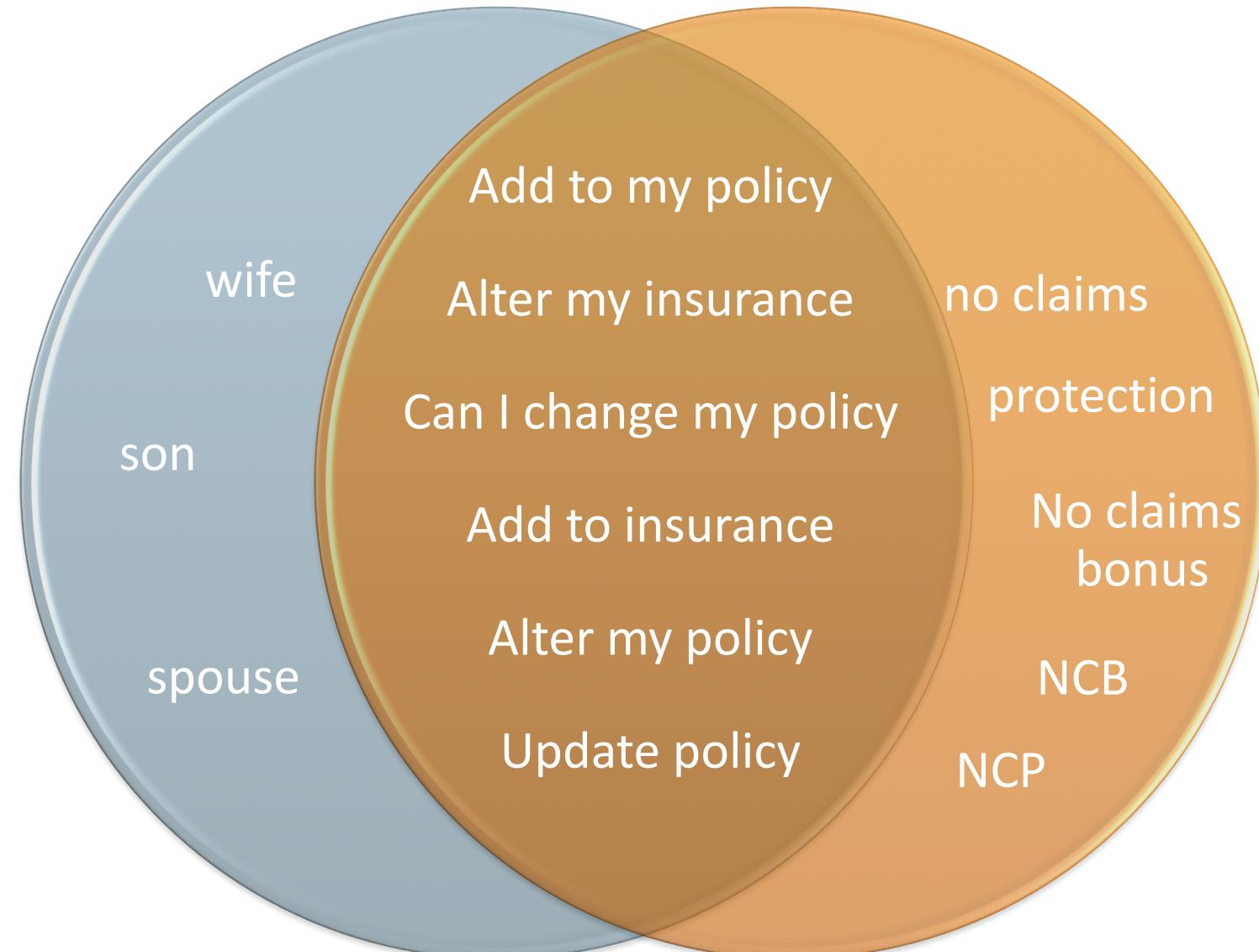
Add no claims protection to insurance

Alter my policy to add no claims bonus

Update policy to include NCP

Updating Policy to add new person

Updating Policy to protect no claims



Updating Policy



Person Entity

spouse

wife

son

Add to my policy

Alter my insurance

Can I change my policy

Add to insurance

Alter my policy

Update policy

Policy Claim Entity

No claims/

protection

No claims bonus

NCB/NCP



Be consistent in your
use of “lexical chrome”



Be consistent in your use of “lexical chrome”

- Some words might be general across all intents but add no “meaning”
 - “please”, “thank you”
- If one intent consistently uses “please” that can skew results if the user uses “please”
- Ensure you don’t unintentionally skew results



Be consistent in your
use of business domain
terms



Be consistent in your use of business domain terms

- Generally applied to Trainer Ht
- Some business-domain terms can appear in different form
 - Company names, technical terms, products, proper nouns
- Replicate terms in equal measure across utterances
- Consider creating an entity of interchangeable terms/synonyms
 - (see next tip)



Use entities as logical groupings of terms even if entity resolution is required



Use entities to group logic terms

- Generally applied to Trainer Ht
- Consider creating an entity of interchangeable terms/synonyms
 - Even if entity resolution is not required
- Terms defined in an entity aids intent resolution

Can I get a quote for motor insurance

I need insurance for my van

I want to take out an insurance policy for my Golf

CarInsurance



Home insurance



Can I get a quote for home insurance

I need insurance for my caravan

I want to take out an insurance policy for my house

Test

Reset

Bot

Intent

Batch

I want an quote for my BMW

Intent

Confidence

CarInsurance



54.9%

Home insurance



54.9%

CarTypeEntity		X
Value	Synonyms	
Golf		
BMW		
Audi		

Can I get a quote for motor insurance
I need insurance for my van
I want to take out an insurance policy for my Golf

CarInsurance
Home insurance
Can I get a quote for home insurance
I need insurance for my caravan
I want to take out an insurance policy for my house

CarTypeEntity X

Value

Synonyms

Golf

Test

Reset

Bot

Intent

Batch

I want an quote for my BMW

CarInsurance X

Home insurance X

Can I get a quote for home insurance

I need insurance for my caravan

I want to take out an insurance policy for my house

Intent

Confidence

CarInsurance

68.5%

Home insurance

54.9%



You don't need to
cover every form of a
word



Don't need to cover every form of a word

- Generally applied to Trainer Ht
- Different forms of a word are reduced to a common root
 - “want”, “wanted” / “run” “ran” “running” “runs”



Use grammatical
correct sentences



Use grammatically correct sentences

- Applies to Trainer Ht
- Sentence structure may aid intent resolution
 - Therefore use grammatically correct sentence where possible
- However, your data should still reflect your users' language
 - “wanna”, “gonna”, “gotta”, “dunno”



Train the
unresolvedIntent to
handle anti-pattern
phrases



Train unresolvedIntent

- As well as defining utterance for intents, you can also capture phrases which your bot should consider unresolved
 - Create unresolvedIntent intent
 - Use this to record any phrases you specifically DON'T want to be resolved
- Analyze bot conversations and train the bot with any malicious/mismatched/rogue input



Handle “smalltalk”
gracefully



Handle “small talk” gracefully

- Up to 40% of interaction with a bot can be generally chit-chat/smalltalk
 - “are you a bot?”
 - “tell me a joke”
 - “What is the weather like where you are?”
- You need to be prepared to handle gracefully
- A-Team have developed a “small talk” library

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Introduction to quality reports

- Report that highlights possible intent resolution errors
 - Where utterances within intents are too similar
- Use a random 20% of the utterances to test the other 80%
- Compares all possible combination of pairs of intents in order to report
 - High quality: intents are distinct
 - Medium quality: some similar utterances
 - Low quality: the intent pairs aren't differentiated enough
- Indicates the number of utterances which may be problematic

 Int_Agnt_Exm_Authrty
↔ Int_Agnt_Min_Age

 Int_Agnt_Shift_Agncy
↔ Int_Agnt_Shift_Cmpny

2  Int_Agnt_Min_Age
↔ Int_Agnt_Rtrmnt_Age

4

Quality report on utterances

- Indicates utterances that are deemed to be similar
- Misclassified utterances (tests did not resolve to correct intent)

The screenshot shows the Oracle Quality Reports interface. The top navigation bar includes a back arrow, the title 'GR_QualityReports', and various buttons for 'Instant Apps', 'Validate', 'Train', and navigation.

The main content area has a sidebar with icons for 'Utterances' (selected), 'Suggestions', 'History', and other reporting functions. The 'Utterances' tab is active, showing a table with columns for 'Utterance', 'Expected Intent', 'Observed Intent', and 'Accuracy'.

Two sections are displayed:

- Similar Utterances:** Shows pairs of utterances with identical intents. One pair is highlighted: "Int_Agent_Monthly_Statmnt" and "When will i get monthly commission statement" both map to "Int_Agent_Periodicity_Paymnt".
- Misclassified Utterances:** Shows utterances where the expected intent does not match the observed intent. Three examples are listed:

Utterance	Expected Intent	Observed Intent	Accuracy
When will i get commission	Int_Agent_Periodicity_Paymnt	Int_Agent_Monthly_Statmnt	!
Will i get my commission every month	Int_Agent_Periodicity_Paymnt	Int_Agent_Monthly_Statmnt	!
When will i get monthly commission statement	Int_Agent_Monthly_Statmnt	Int_Agent_Periodicity_Paymnt	!

At the bottom, there is a page navigation bar showing 'Page 1 of 106'.

Quality report suggestions

- Reports any suggested changes you can make to your intents or utterances

The screenshot shows the Oracle Quality Reports interface with the title 'GR_QualityReports' at the top. The main area displays a 'Suggestions' tab, with 'Utterances' and 'History' also available. A green button labeled 'Rerun Report' is visible. A search bar with a 'Filter' placeholder and a magnifying glass icon is present. Below the search bar, there's a 'Sort By' dropdown set to 'Item Type Ascending'. A section titled 'Items with Suggestions' lists one item: 'Empty Intent' with a flag icon. A message states: 'There should be 5 or more utterances defined for the Empty Intent intent.' At the bottom, it says 'Page 1 of 1 (1 of 1 items)' with navigation arrows.

Quality report history

- View past user input ranked by win margin and confidence level
- Useful for
 - Narrow margins between intent classification
 - Intent resolution failures
 - Low confidence resolution

The screenshot shows the 'GR_QualityReports' application interface. On the left is a sidebar with icons for Home, Utterances, Suggestions, History, Instant Apps, Validate, Train, and Help. The main area has tabs for Utterances, Suggestions, and History, with History selected. A search bar at the top says 'Show me all customer messages Last 30 Days' with a date range '2/3/18 - 3/5/18'. Below it, a filter for 'Win Margin Is Less Than 10%' is shown. A green button labeled '+ Criteria' is visible. To the right, there are two sections: 'Customer Message' (listing five messages) and 'Intent Data' (listing two intents with their win margin and confidence levels). At the bottom, there's a 'General' section with timestamp and channel information.

Customer Message	Intent	Win Margin	Confidence
what do i do once I passed test	Int_Agent_After_Exam_Procedure	3.9%	18%
where can I sit an exam	Int_Agent_Passing_Marks	N/A	14%
Is there a method for applying to be a specialist on the web			
can I add my wife			
how much to be an agent			

Intent Data:

Intent	Win Margin	Confidence
Int_Agent_After_Exam_Procedure	3.9%	18%
Int_Agent_Passing_Marks	N/A	14%

General:

Timestamp	Channel
3/2/18	test

Quality report history

- Show top intents that resolved with low confidence

Top Intent Confidence ▾ Is Less Than ▾ 50% ▾ ▾ ×

- Show where there may have been ambiguity between intents

Win Margin ▾ Is Less Than ▾ 20% ▾ ▾ ×

- Show me used input where the top intent was unresolved

Top Intent Name ▾ Is Equal To ▾ unresolvedIntent ×



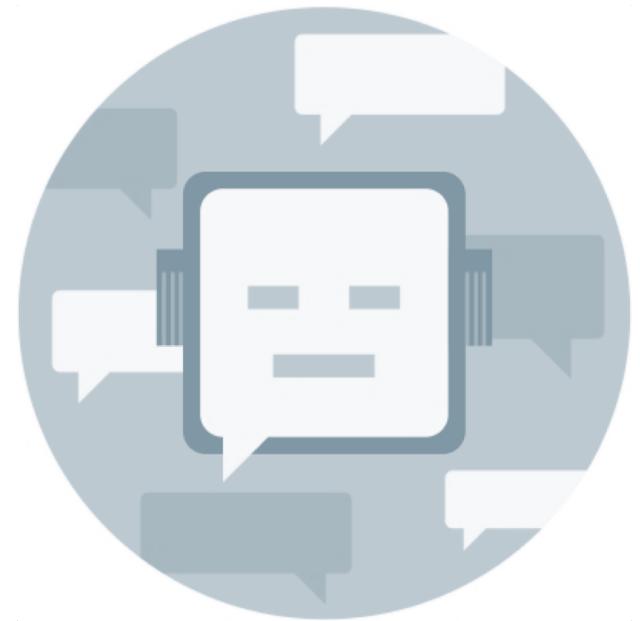
Advanced Bot Training Hands-On

Lab 1

Topic Agenda

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Sometimes a question is what it is;
a question.

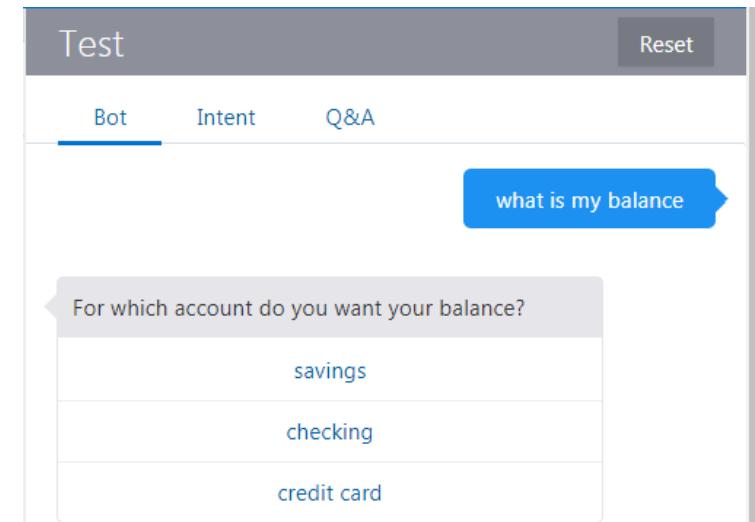


Q & A builder

- Intent resolution – sentence level resolution
 - Trying to establish meaning from a sentence
 - Meaning and structure are important
 - Maps to a single transaction/usecase
- QnA – word level resolution
 - Uses an intelligent search across questions and answers
 - Can be tuned to define Q&A terms and stop words
- “Lost my bank details, need to reset password”
- “Can I return these shoes”

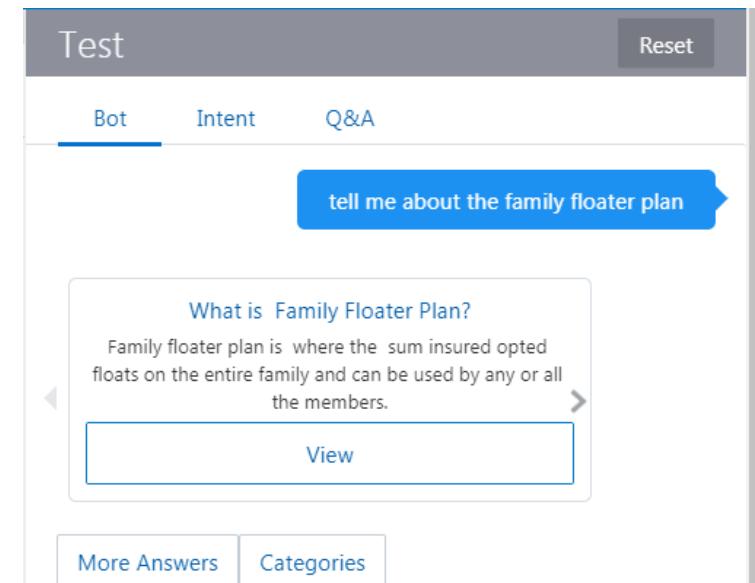
Q & A runtime

- Intent resolved
- Q & A resolved
- Could be intent or Q &A



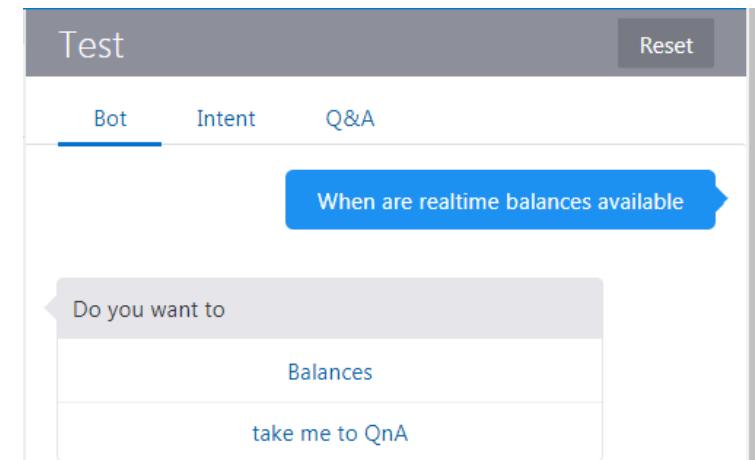
Q & A at runtime

- Intent resolved
- Q & A resolved
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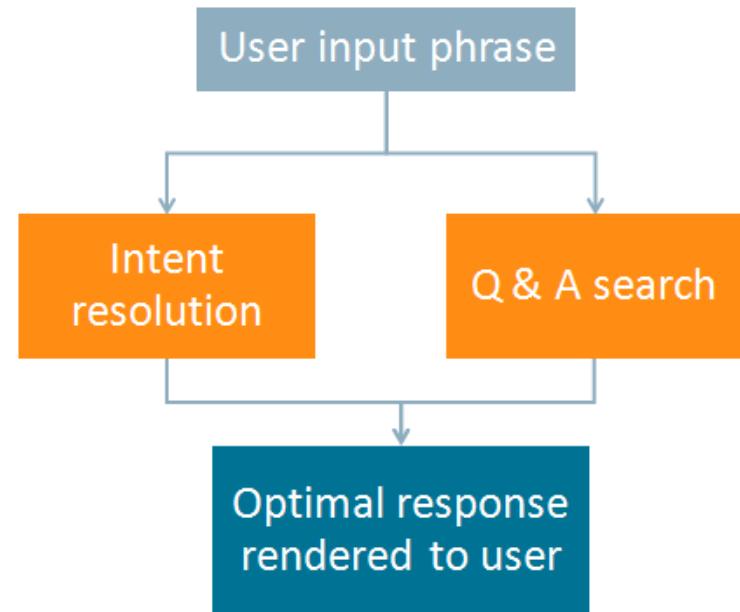
Q & A at runtime

- Intent resolved
- Q & A resolved
- Could be intent or Q &A



Q & A routing is based on

- The results of intent and QnA matching
 - Intent resolution
 - Minimum match of QnA
- Use of imperative verbs assumes intent
 - “do”, “give” “cancel”
 - Platform understands the concept of imperative verbs
 - You can explicitly define your own
- More later...



Q & A routing is based on

- qnaMinimumMatch in System.Intent
- Defines % of tokens that must match
 - E.g. 50%, 25% means we first of all look for 50% of matches, if not, we look for 25% - thus trying to ensure we only drop to 25% if we can't resolve to a higher quality
- Token is not necessarily a word
 - Stop words are ignored
 - Tokens are generated for word pairs
 - "Balance in my checking account" and "Checking balance in my account", then search for "checking account" will return "Balance in my checking account"

Q & A builder - how it works

- “Smart” logic to search/index
 - Automatically stems words when indexing
 - “festival”, “festive”, “festivity” all represented as the same stem
 - Ignores stop words (“a”, “of”, “are” etc)
 - Fuzzy matching (tolerant of one or two char differences)
 - Define synonyms and abbreviations

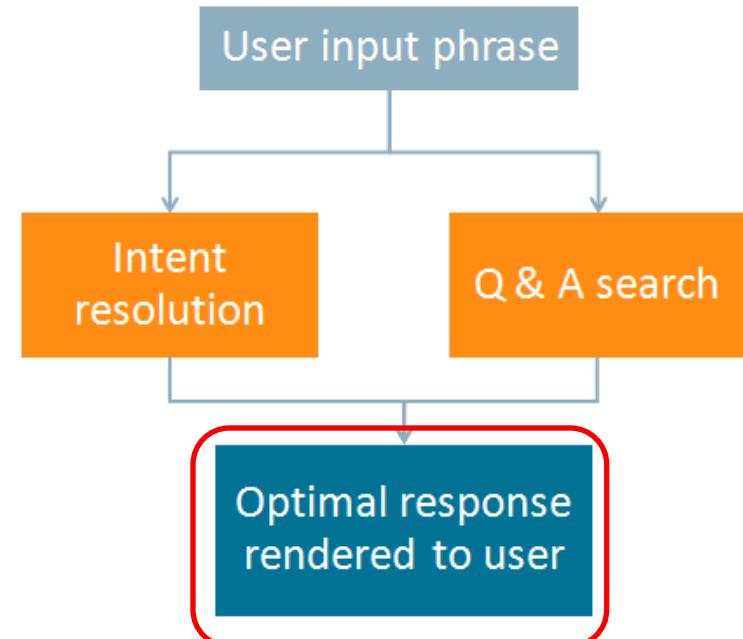
The screenshot shows the Oracle Q&A builder interface. On the left, there's a configuration panel with tabs for 'Data Sources' and 'Language Config'. Under 'Language Config', there's a 'Config Entry' section with a table:

Enabled	Type	Definition
✓	Ignored words	a, about, all, also, am, an, and, any, are, as, ask, at, b, be, being, but, by, can, could, d, did, do, does, e, else, etc, f, for, from, g, go, h, had, has, have, have, he, help, here, his, how, i, ie, if, in, into, is, it, k, know, l, let, m, me, mine, mr, mrs, my, n, need, no, now, o, of, oh, ok, on, or, p, please, q, r, s, say, see, seem, shall, she, should, show, so, still, such, t, tell, that, the, their, them, then, there, these, they, this, to, too, try, u, until, us, v, via, viz, vs, w, want, was, way, we, what, when, where, whether, which, while, who, will, with, would, x, you, your, z Last updated: 36 minutes ago
✓	Synonym	wife, spouse

On the right, there's a 'Test' panel with tabs for 'Bot', 'Intent', and 'Q&A'. The 'Bot' tab shows a message box with the question "how do I add my wife for insurance". Below it, a response box contains: "I have already taken a PA policy and renewing the same. Can I add my spouse in the current policy? You can add your spouse in the current policy and review your Capital Sum Insured at the time of renewal." A red arrow points from the word 'wife' in the question to the word 'spouse' in the response.

Q & A builder - how it works

```
intent:  
  component: "System.Intent"  
  properties:  
    variable: "iResult"  
    confidenceThreshold: 0.2  
    confidenceWinMargin: 0.32  
    optionsQnaLabel: "Check our our FAQ on this topic"  
    optionsPrompt: "Hey, I wasn't sure, do you want to..."  
    qnaSkipIfIntentFound: true  
    qnaEnable: true  
  transitions:  
    actions:  
      Balances: "startBalances"  
      Transactions: "startTxns"  
      Send Money: "startPayments"  
      Track Spending: "startTrackSpending"  
      Dispute: "setDate"  
      Reset password: "resetPWState"  
      unresolvedIntent: "unresolved"  
      qna: "qna"
```



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  Send Money: "startPayments"  
  Track Spending: "startTrackSpending"  
  Dispute: "setDate"  
  Reset password: "resetPWState"  
  unresolvedIntent: "unresolved"  
  qna: "qna"
```

how do I reset password

We are resetting your password

Q & A builder - how it works

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  Send Money: "startPayments"  
  Track Spending: "startTrackSpending"  
  Dispute: "setDate"  
  Reset password: "resetPWState"  
  unresolvedIntent: "unresolved"  
  qna: "qna"
```

how do I reset password

We are resetting your password

how do I reset password

Hey, I wasn't sure, do you want to...

Check our our FAQ on this topic

Reset password

Q & A builder - how it works

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  Balances: "startBalances"  
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  Send Money: "startPayments"  
  Track Spending: "startTrackSpending"  
  Dispute: "setDate"  
  Reset password: "resetPWState"  
  unresolvedIntent: "unresolved"  
  qna: "qna"
```

how do I reset password

We are resetting your password

how do I reset password

Hey, I wasn't sure, do you want to...

Check our our FAQ on this topic

Reset password

Q & A builder - how it works

```
qna:  
  component: "System.QnA"  
  properties:  
    transitionOnTextReceived: true  
    categoryListLimit: 4  
    matchListLimit: 3  
    viewAnswerLabel: "Show me!"  
    moreAnswersLabel: "Show me more"  
    answersLabel: "Drill in here!"  
    categoriesLabel: "Browse FAQ"  
    exitLabel: "Exit Label"  
    keepTurn: true  
  transitions:  
  actions:  
    none: "unresolved"  
  next: "output"
```

How do I reset my password

In order to reset your password you need to call our call center on 555-1234 or send an email to x@y.com

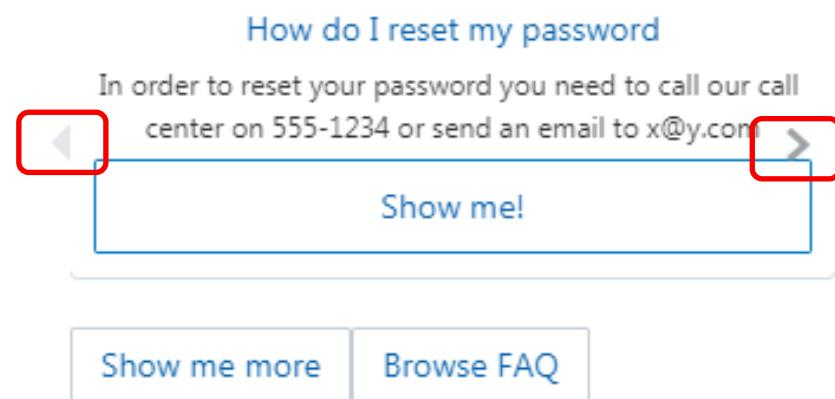
Show me!

Show me more

Browse FAQ

Q & A builder - how it works

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  transitions:  
  actions:  
    none: "unresolved"  
  next: "output"
```



Q & A builder - how it works

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qna:  
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    categoryListLimit: 4  
    matchListLimit: 3  
    viewAnswerLabel: "Show me!"  
    moreAnswersLabel: "Show me more"  
    answersLabel: "Drill in here!"  
    categoriesLabel: "Browse FAQ"  
    exitLabel: "Exit Label"  
    keepTurn: true  
  transitions:  
  actions:  
    none: "unresolved"  
  next: "output"
```

How do I reset my password

In order to reset your password you need to call our call center on 555-1234 or send an email to x@y.com

Show me!

Show me more **Browse FAQ**

Q & A builder - how it works

```
qna:  
  component: "System.QnA"  
  properties:  
    transitionOnTextReceived: true  
    categoryListLimit: 4  
    matchListLimit: 3  
    viewAnswerLabel: "Show me!"  
    moreAnswersLabel: "Show me more"  
    answersLabel: "Drill in here!"  
    categoriesLabel: "Browse FAQ"  
    exitLabel: "Exit Label"  
    keepTurn: true  
  transitions:  
  actions:  
    none: "unresolved"  
    next: "output"
```

What is Family Floater Plan?

Family floater plan is where the sum insured opted floats on the entire family and can be used by any or all the members.

Show me!

Show me more

Browse FAQ

Browse FAQ



Q & A builder - how it works

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  component: "System.QnA"  
  properties:  
    transitionOnTextReceived: true  
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Show me!

Show me more

Browse FAQ

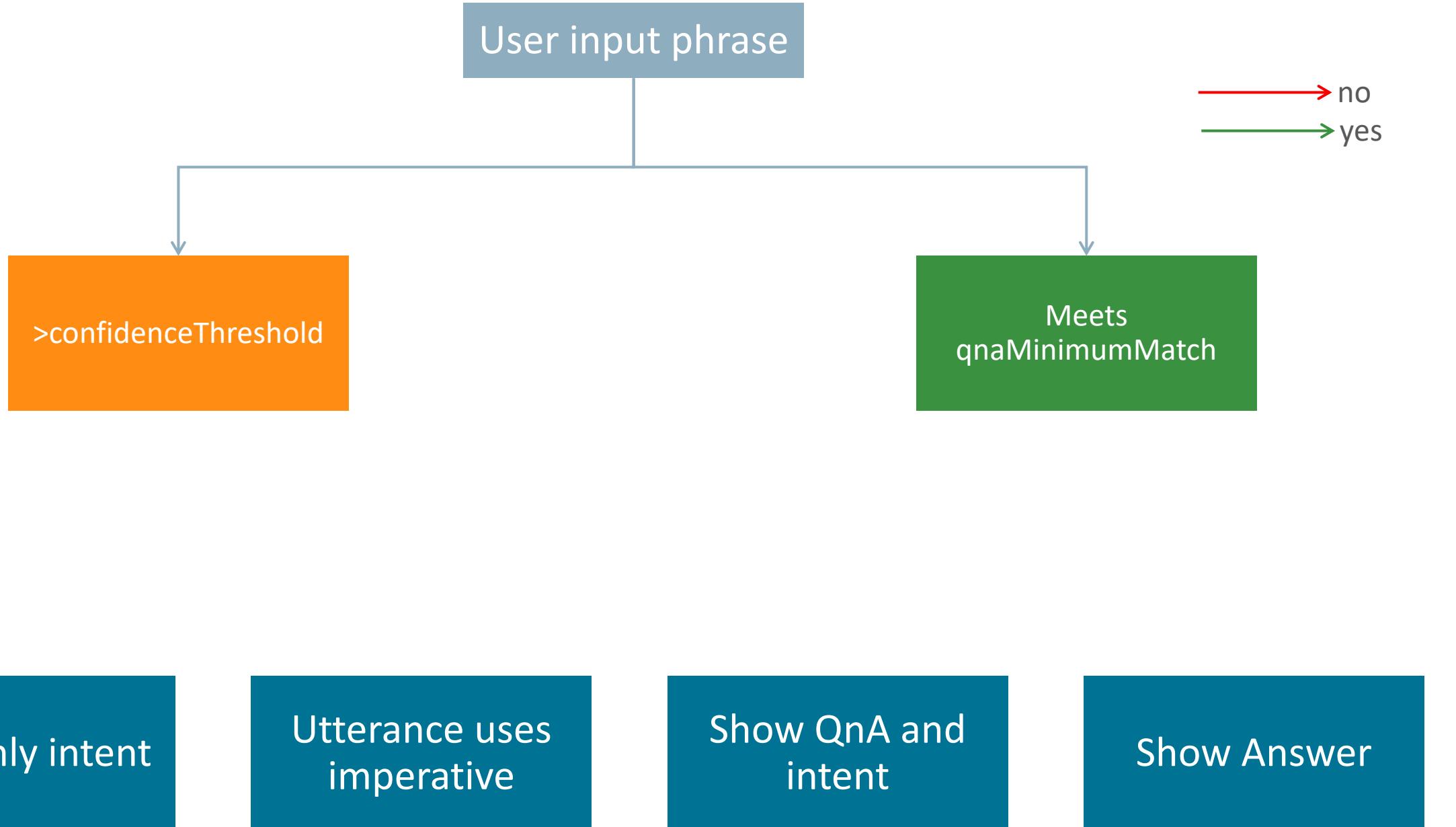
Browse FAQ

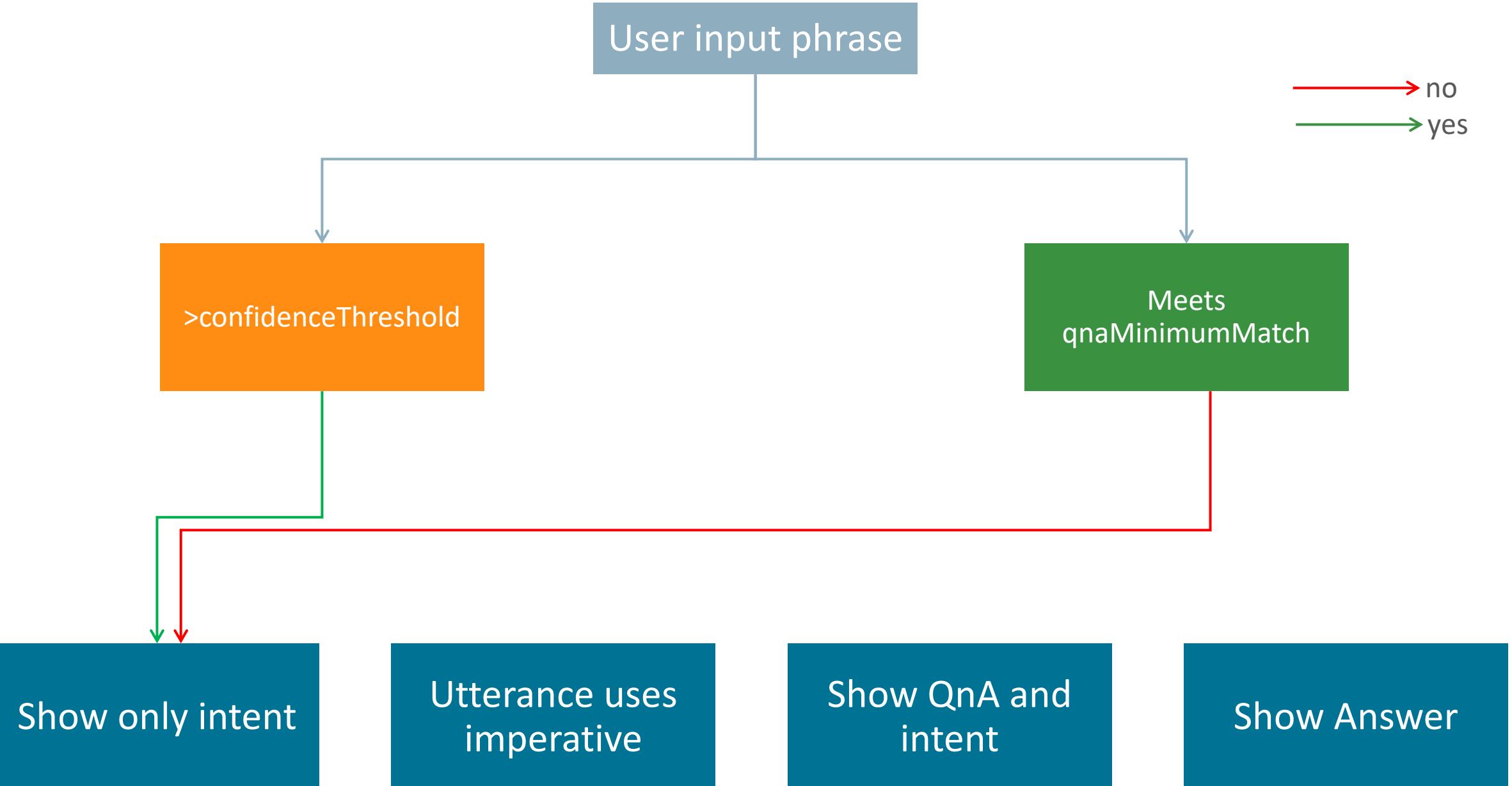
Trvl

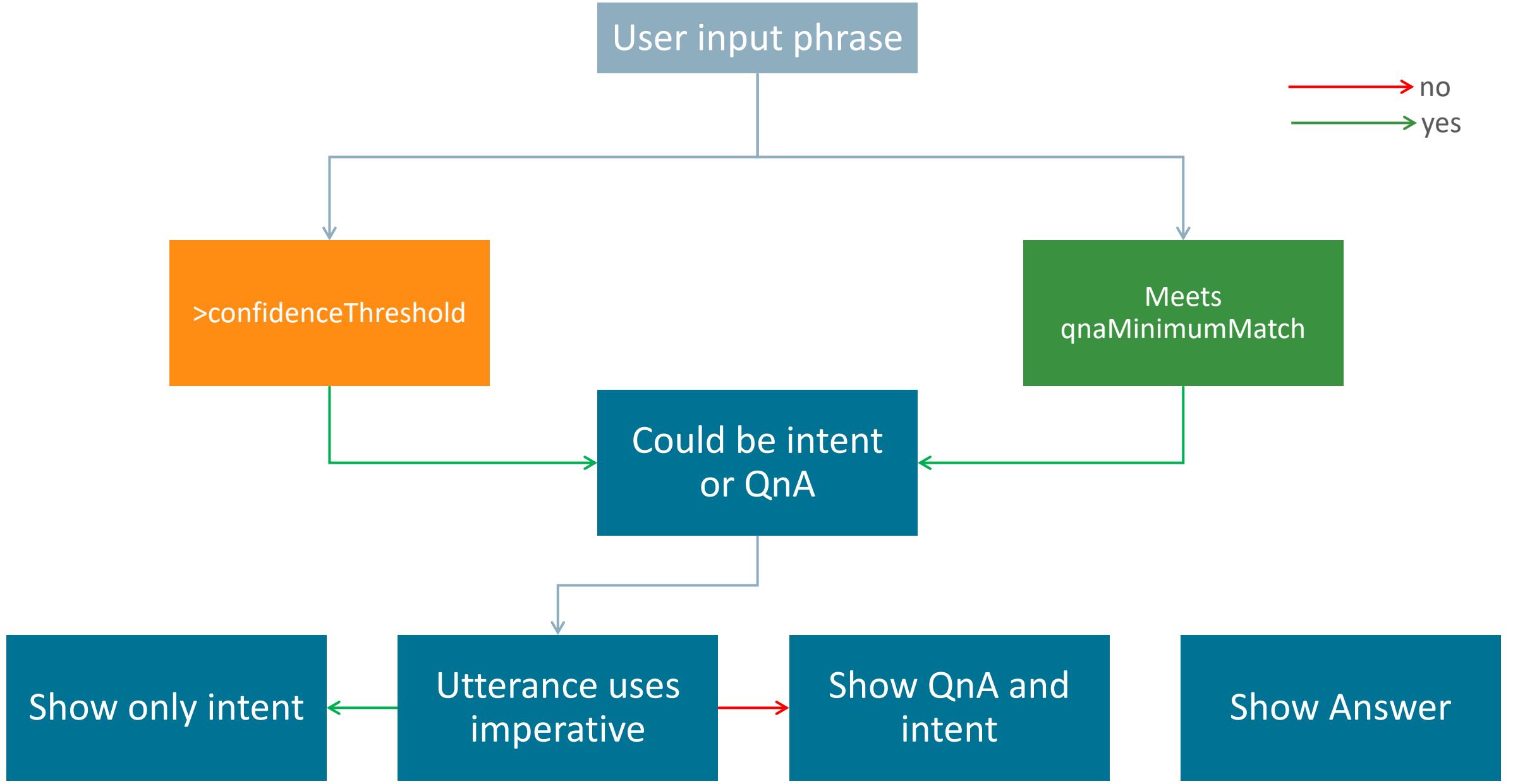
Drill in here!

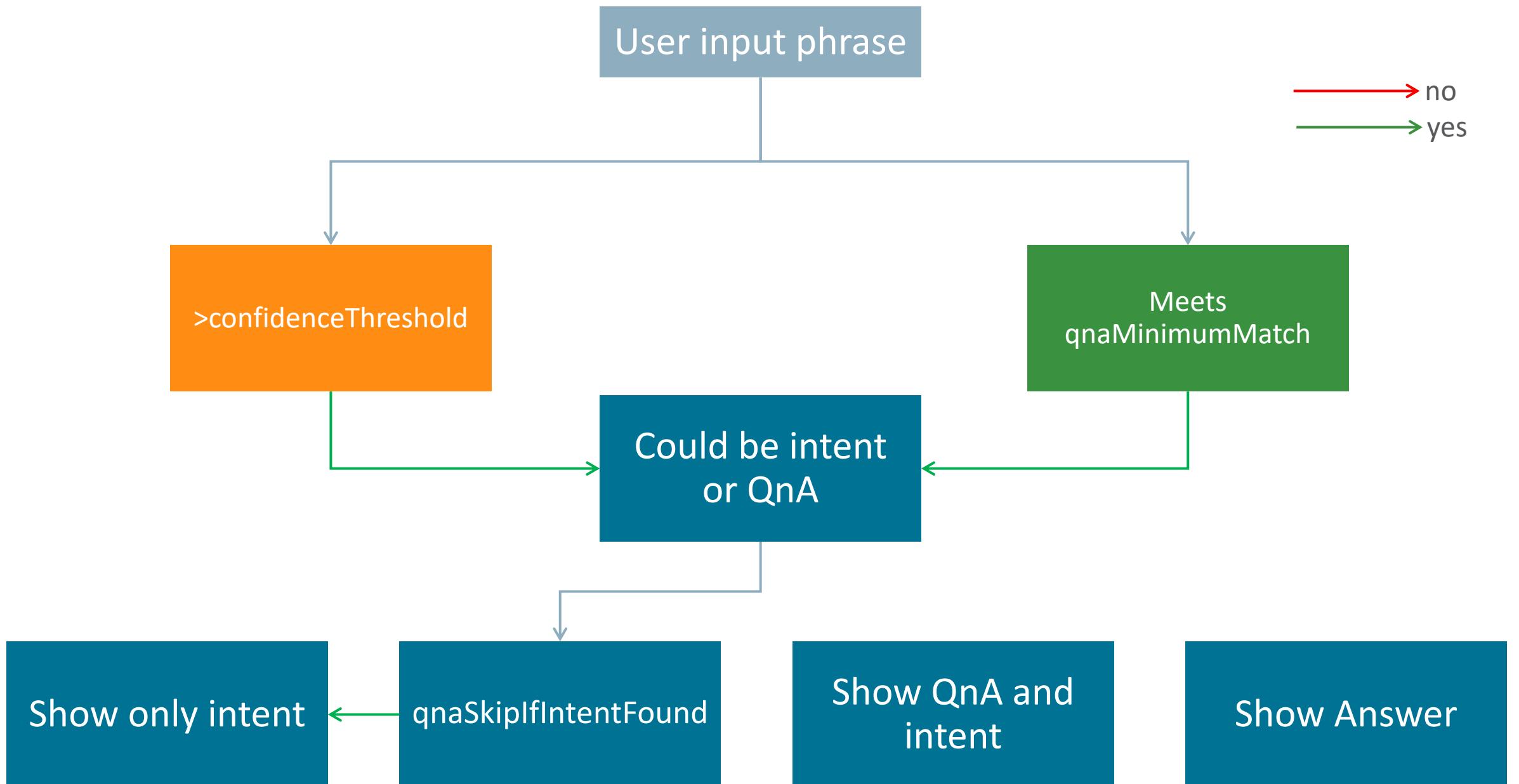
Pacc

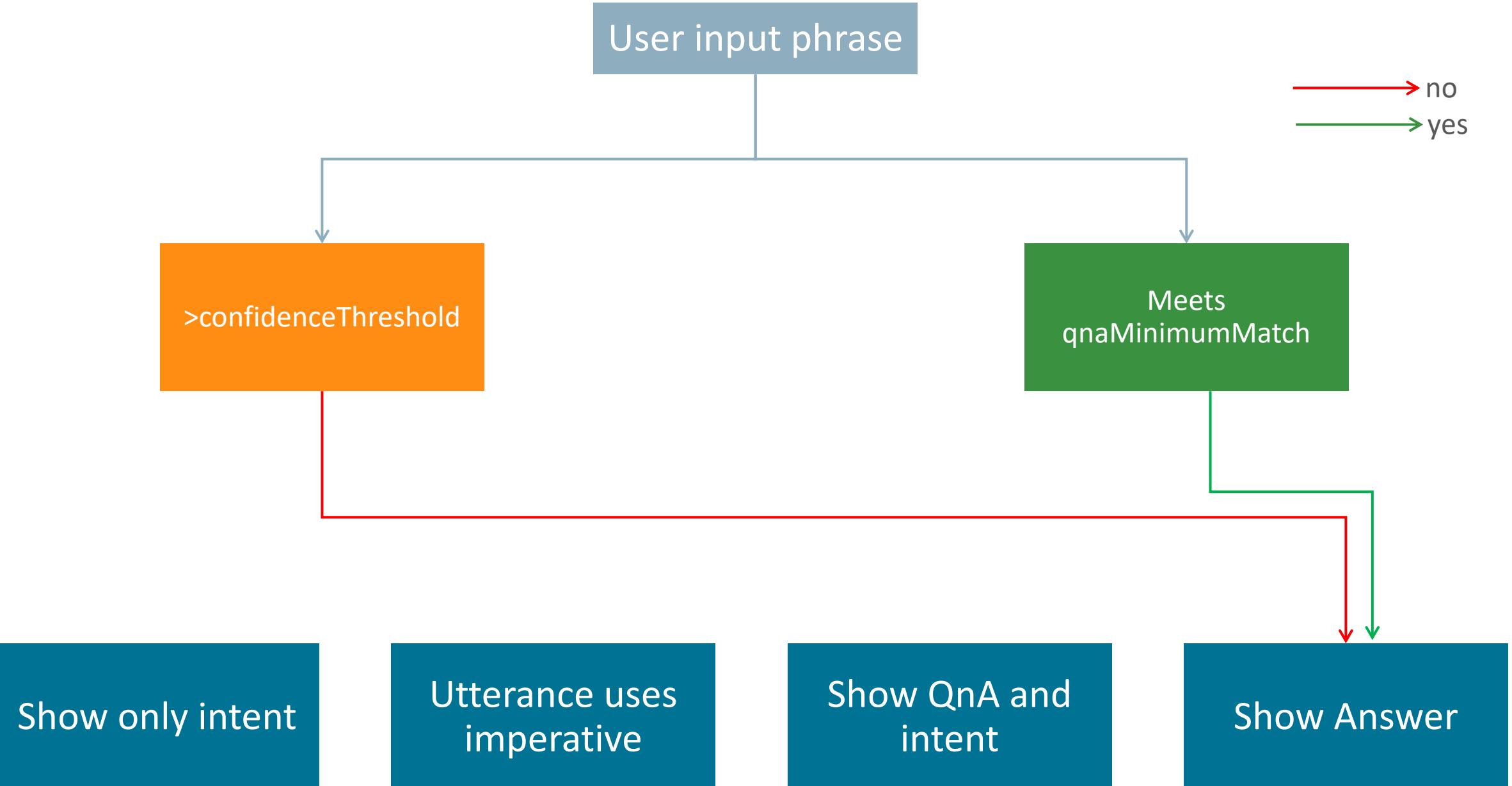
Drill in here!

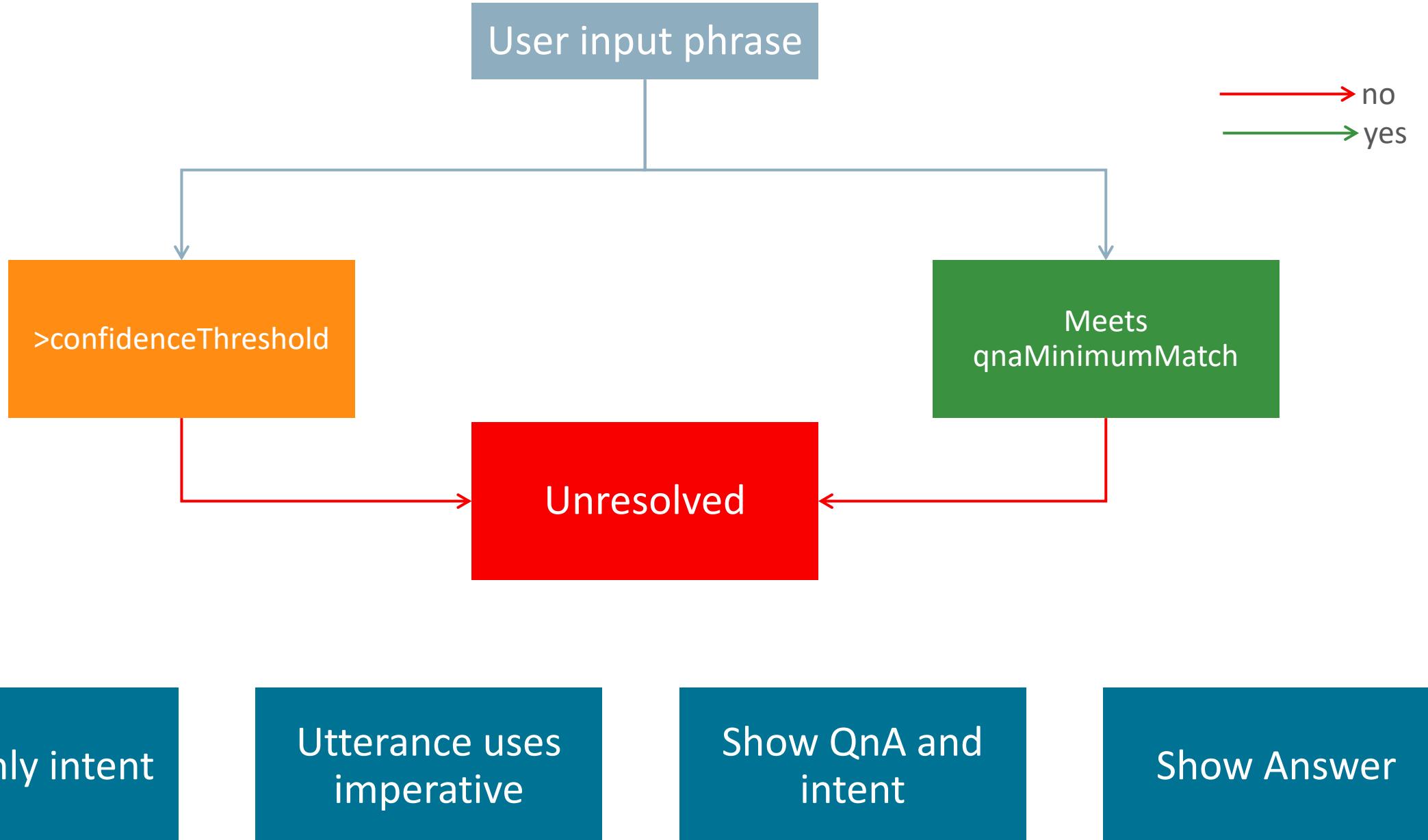












Q & A routing

- Transaction Config
 - Input is then treated as intent
- Question Config
 - Ensures QnA shown first in choice dialog

The screenshot shows the Oracle Service Cloud interface with the 'Q&A Routing Config' tab selected. On the left, there's a sidebar with various icons. The main area displays configuration sections:

- Transaction Config**:
 - Additional Request Verbs: absolutely, apply
 - Request Verbs Prefix: please
 - Request Verbs Expansion: re, re-, un, dis
- Question Config**:
 - Question Verbs Prefix: why, how to, how do i, do i, how can, what's the cause, whats the cause, what is the cause

At the bottom, a sample conversation is shown:

Hey, I wasn't sure, do you want to...
Check our our FAQ on this topic
Reset password



Advanced Bot Training Hands-On

Lab 2

Integrated Cloud Applications & Platform Services

ORACLE®