

**ORACLE®**

# Oracle Digital Assistant

## The Complete Training

Training your model

# 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 Digital Assistant
- 2 ➤ General guidelines for training your skills
- 3 ➤ Specific tips for training your skills
- 4 ➤ Tips for designing intents
- 5 ➤ Training the digital assistant
- 6 ➤ Quality reports

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# Why have different training models?

- Trainer Ht
  - Rules based
  - Fast & best suited for small set of utterances
  - Good for new development
- Trainer Tm
  - 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

# Why have different training models?

- Intent Answers now a feature of intents
  - Allows QnA style of interaction without specific OBotML
  - Uses intent resolution models
  - Optimized model has to be switched on

Display Name	GR_ConversationDesigner
Name	GR_ConversationDesigner
Version	1.0
Category	<i>Category your Skill bot falls under</i>
One-Sentence Description	
Detailed Description	<i>This description appears on the skill's Details page in the skills catalog</i> 2048 characters left
Training Model	Trainer Tm
Optimize for Answer Intents	<input checked="" type="checkbox"/>
Translation Service	None
Use <a href="#">Translation Service</a> to define a service.	

Intent

Filter

Sort By Created Ascending

Description

Conversation Name \* ConvertFreeToPaid

Name \* ConvertFreeToPaid

Category your Skill bot falls under

AlwaysFree

AutonomousDatabase

CloudInfra

CloudPromotion

ConvertFreeToPaid

CreditsExpire

CreditUsageDiscount

DiscountRates

FreeCountries

FreePaidAccounts

FreeTrial

HowLongFreeCredits

HowSignIn

Answer

You can upgrade your cloud account to paid at any time. Simply go to Account Management in the Oracle Cloud Console and complete the upgrade steps.

Examples

Filter

Enter your example utterances here.

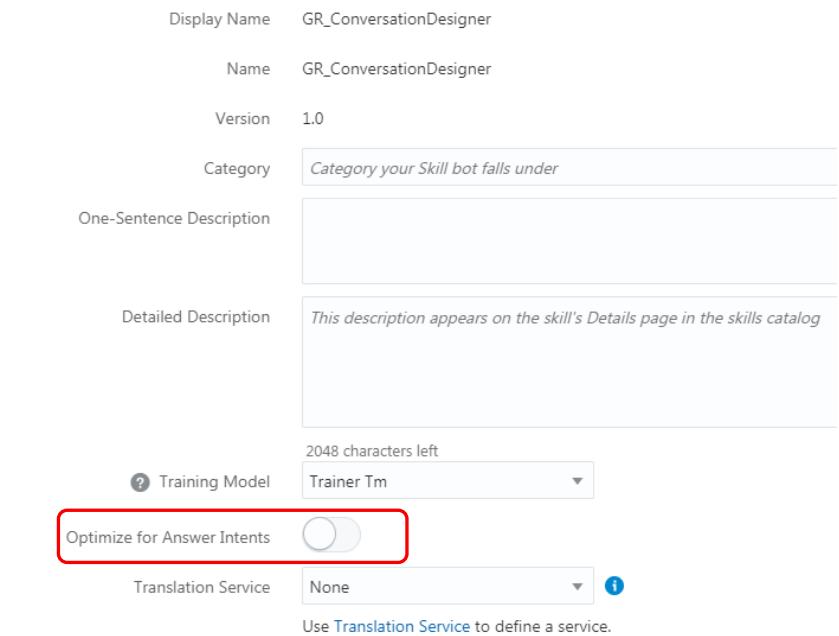
Can I convert to a paid account

Can I go to a paid account when the trial ends

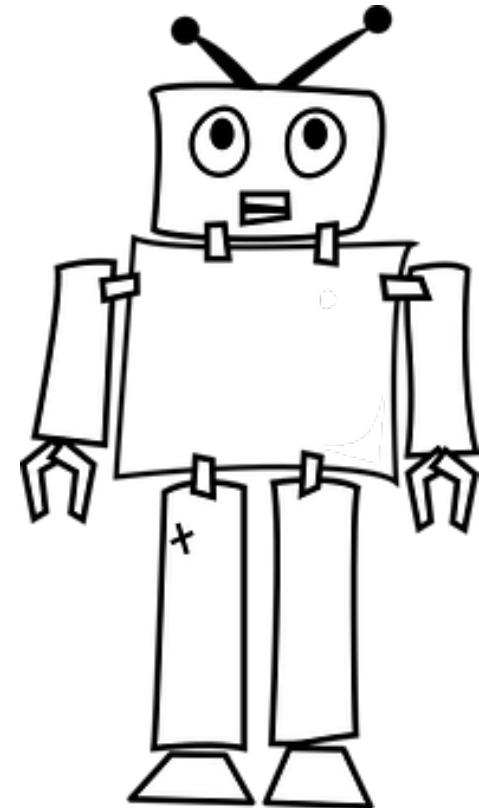
How do I convert my Oracle Cloud Free Tier account to a paid account?

# Where are we going with training models?

- Trainer Ht, Tm and QnA continue to evolve every release
  - 19.4.1 Tm similar to previous releases
  - OCI Native 19.10 advanced in TrainerTm
- We are considering moving towards a “unified model” (rev rec rules apply)
  - Recommended for answer intents
  - Could be used for Trainer Tm
  - GPU intensive for training
  - Off by default



Your digital assistant is only as  
**smart** as the data you train it with  
(rubbish in, rubbish out)

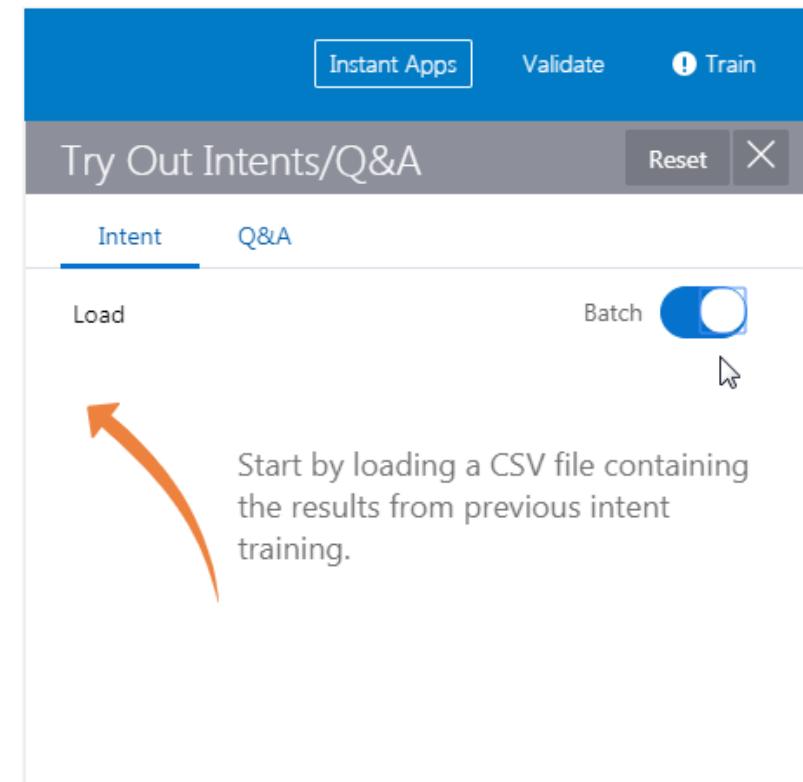


# Topic agenda

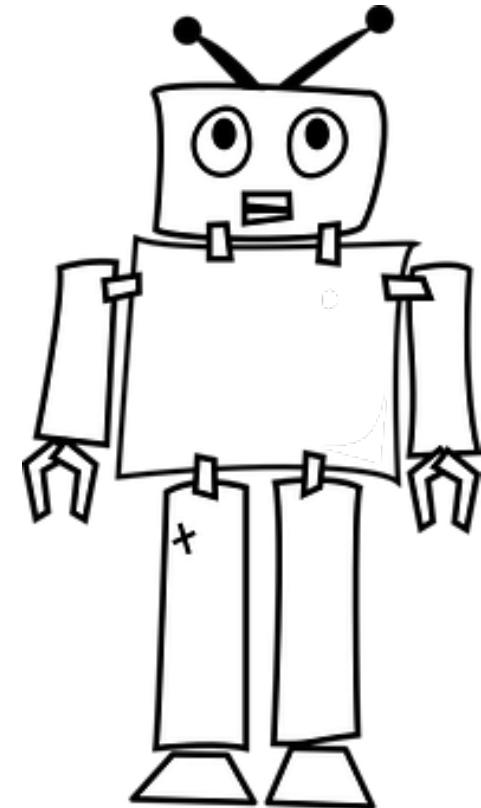
- 1 → Recap – the models in Oracle Digital Assistant
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- 6 → Quality reports

# General guidelines for training your skills

- You MUST have buy in for the long term
- Your first release will have the language understanding of a 2 year old (if you are lucky!)
  - But that's ok, you need to start somewhere
- Plan for NLP improvement
  - The only real data is user data
  - Train, test, repeat
  - Use batch training feature
  - For all new data perform a 80/20 split
    - 80% training data, 20% testing data



**Many bot projects fail because of unrealistic expectations. Get buy in for the long term, start small, grow.**



# General guidelines for training your skills

- Your goal is to train the model on real-world sample utterances
  - Synthesized utterances are no substitute for real world utterances
- Real-world data will likely need to be manually classified
  - It is not always clear what phrases map to an intent
    - Needs to be decided by project team: business, conversational designer, developer
- You shouldn't necessarily sanitize user data
  - Include common mis-spellings, slang, synonyms, abbreviations where it makes sense

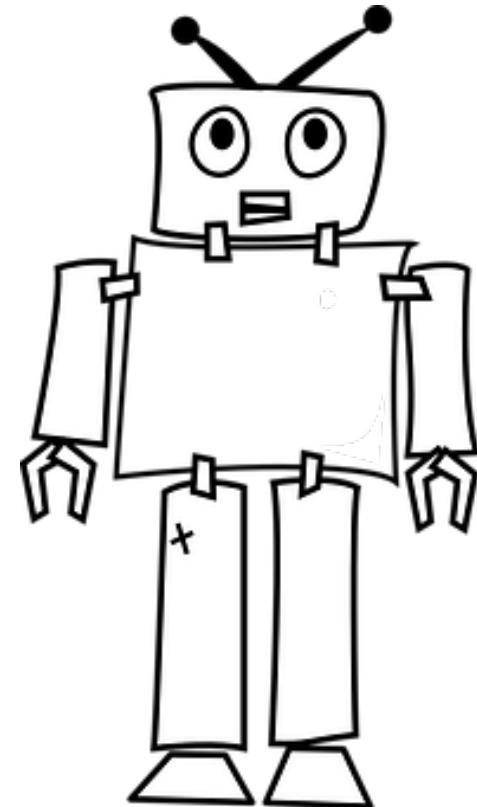
# General guidelines for training your skills

- The golden rules to help you develop good understanding
  - For production use Trainer Tm
  - Real world utterances
  - Well design and classified intents
  - Train unresolved (anti-usecase) utterances
  - As many as you need to get the results you desire
    - Our research has shown a “plateauing off” around the 92% accuracy level

# Synthesizing utterances when you have no existing data

- Trainer Ht best place to start off
  - Generally better with smaller data sets
  - Plan to move to Trainer Tm as you gather more sample user inputs
- You have to synthesize sample utterance
  - Your primary goal is to help disambiguate intents
- A model has 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

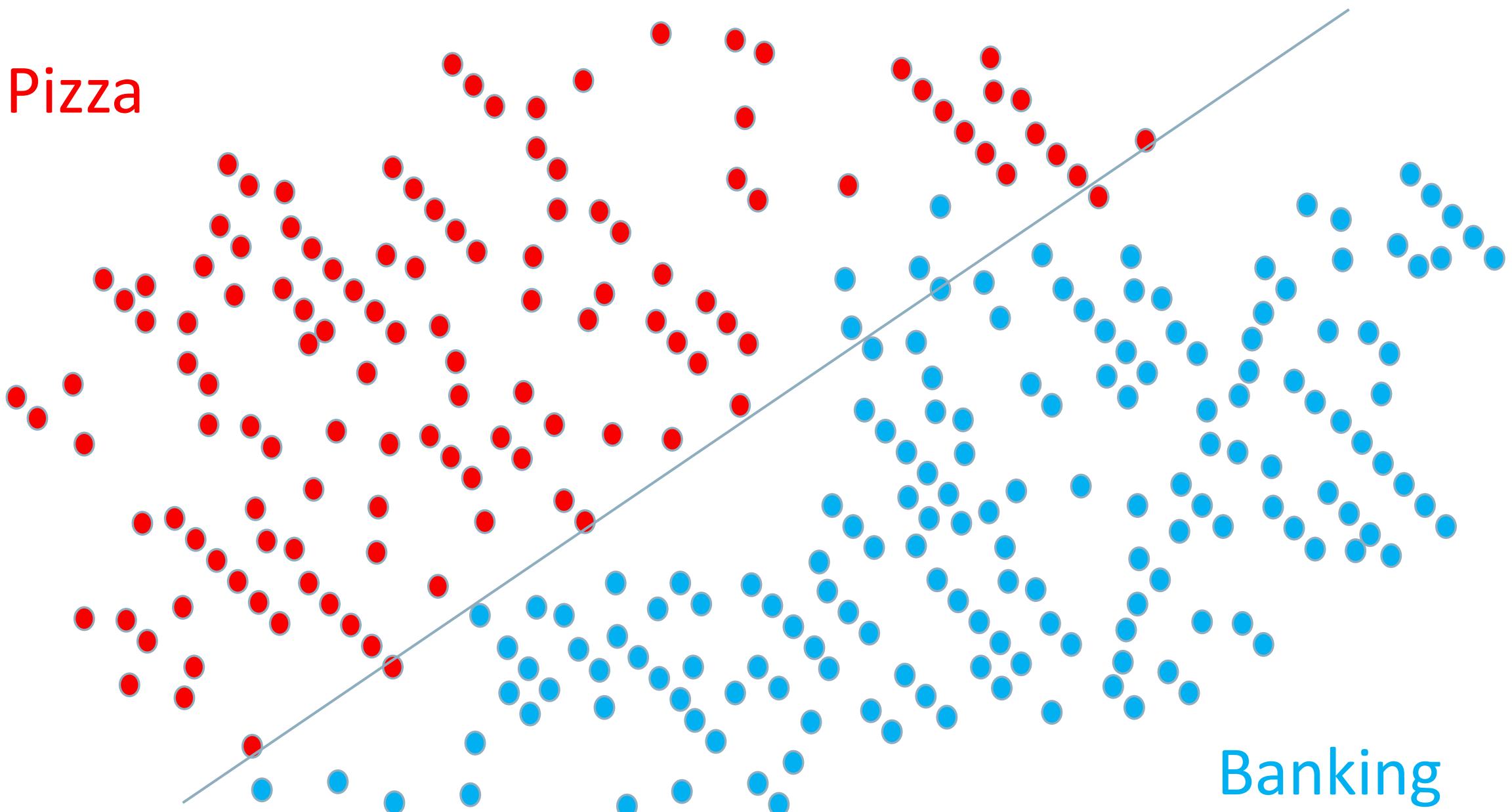
So if I am going to build a **good model** shouldn't I know how it works?



Pizza

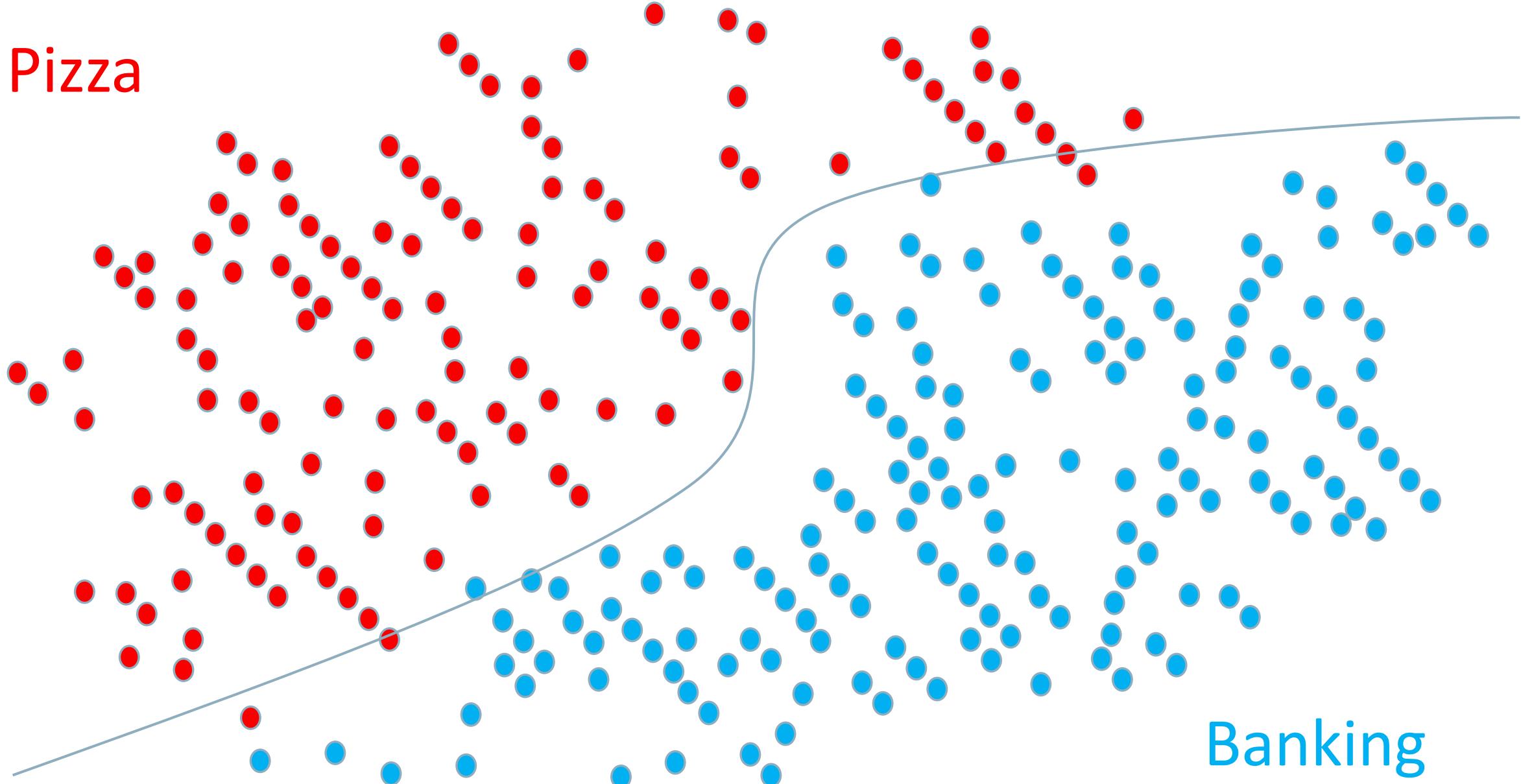


Pizza



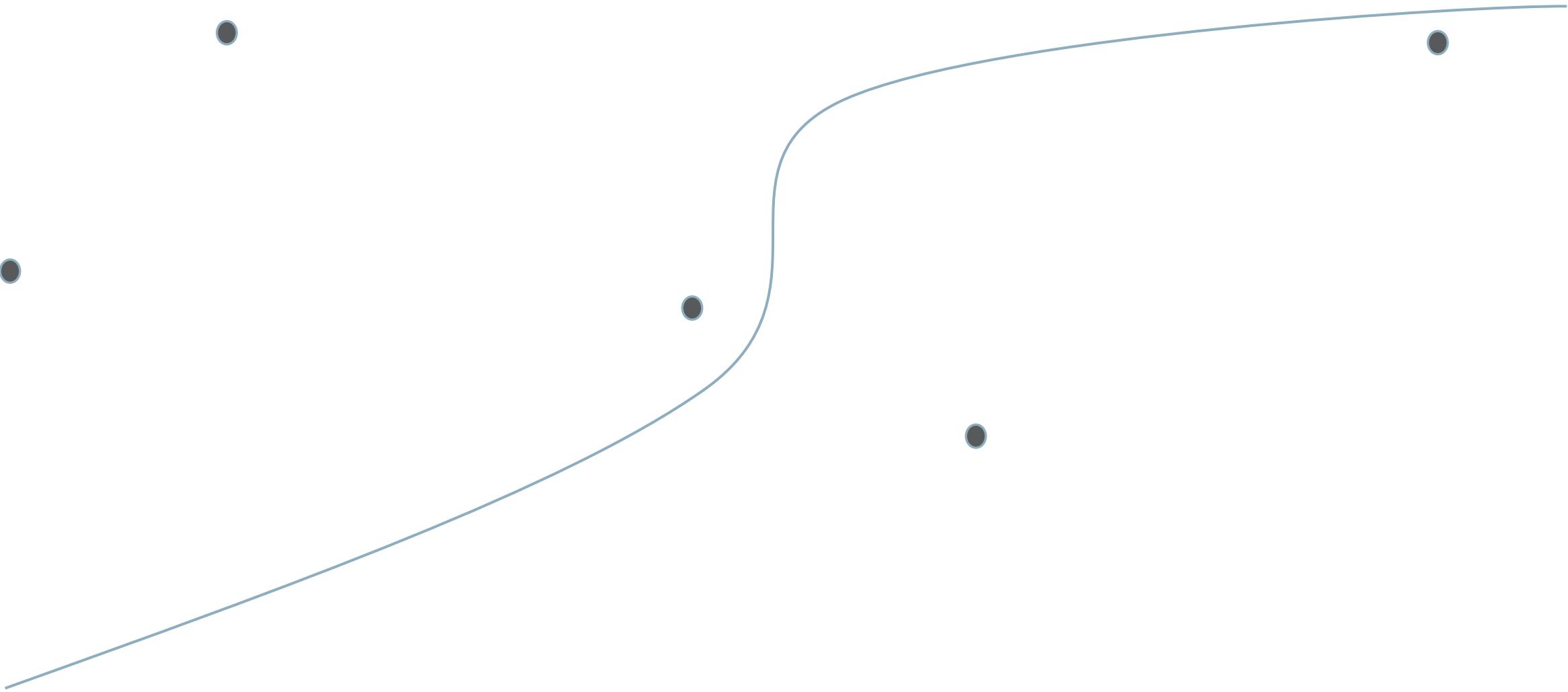
Banking

Pizza

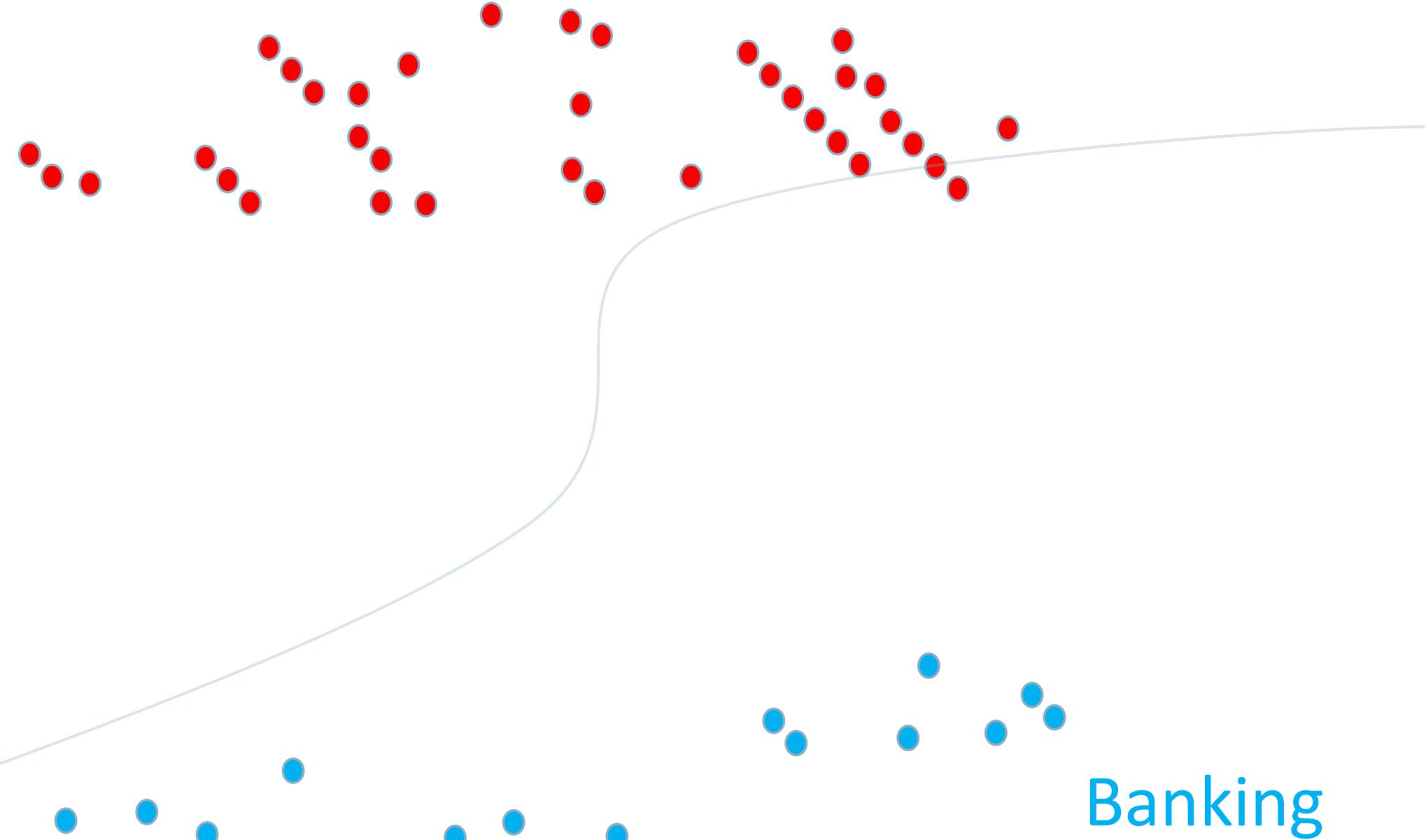


Banking

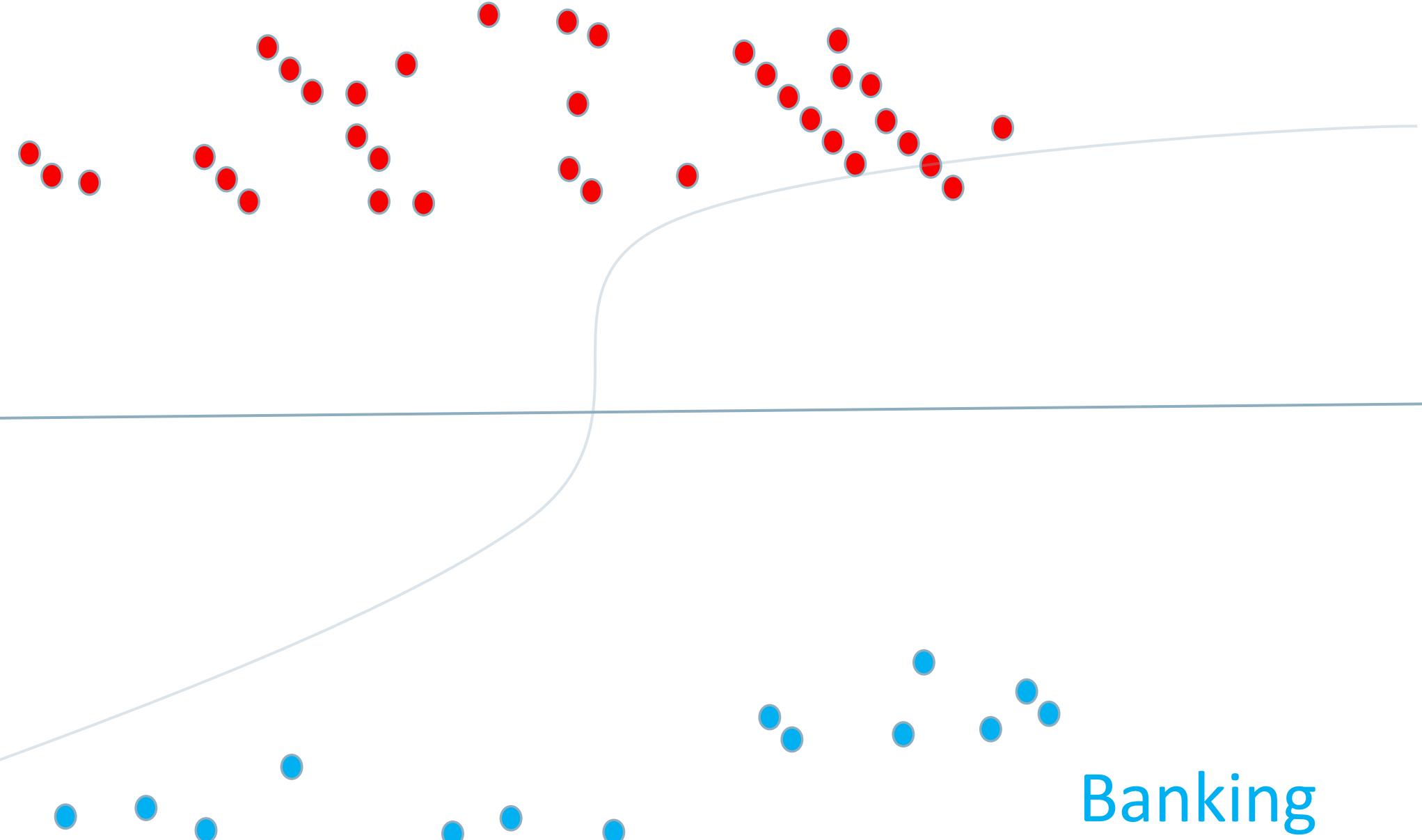
# Pizza



Pizza

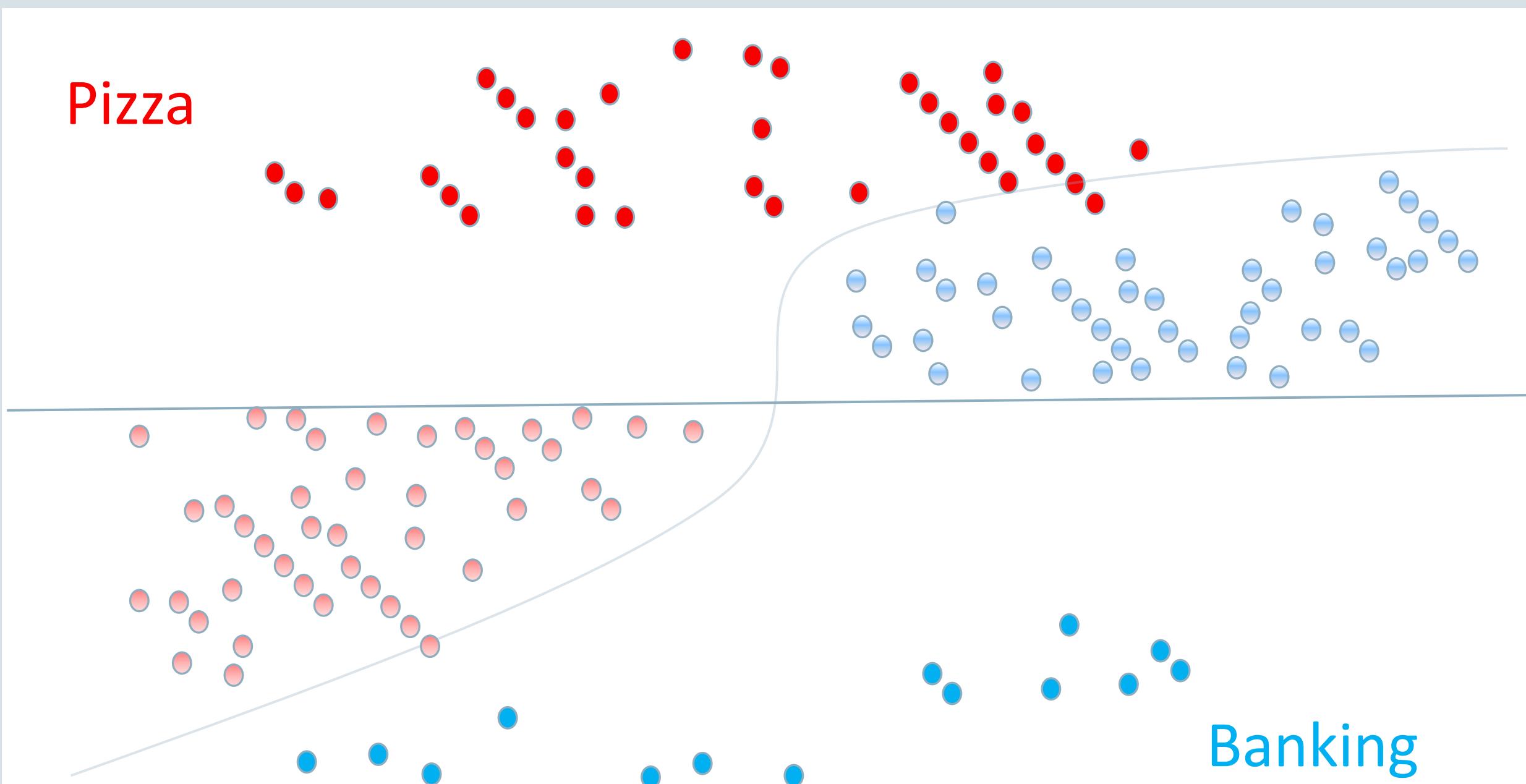


Pizza

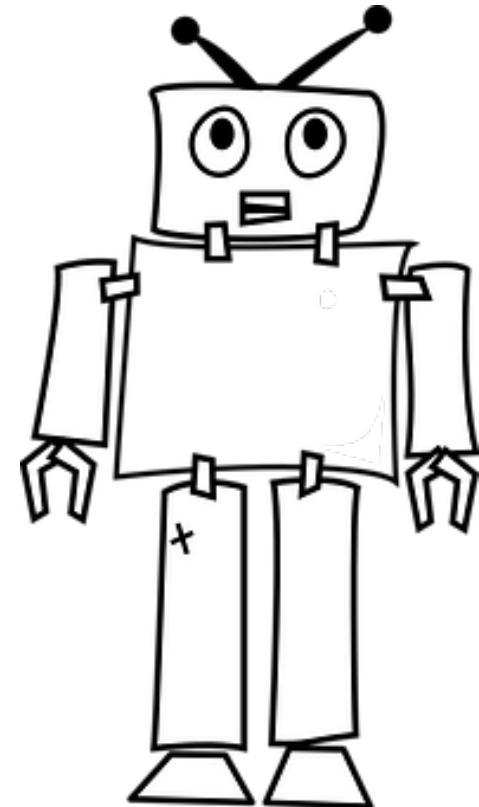


Pizza

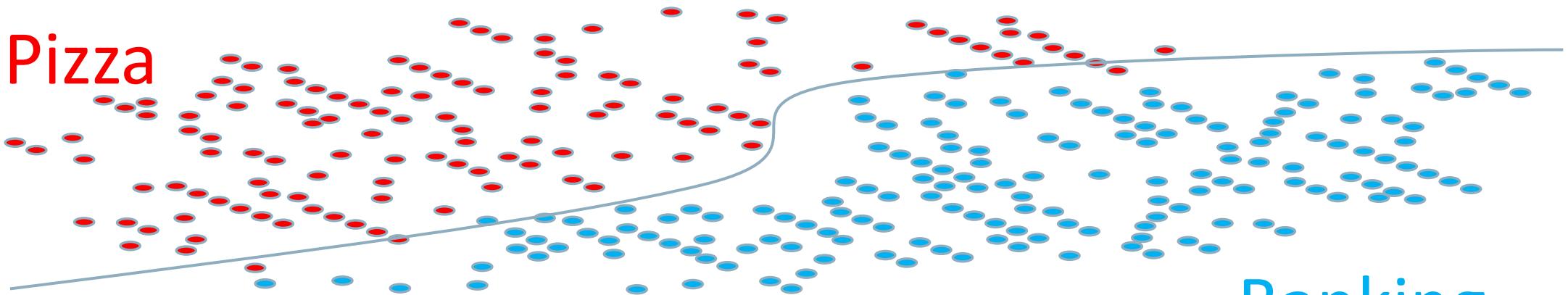
Banking



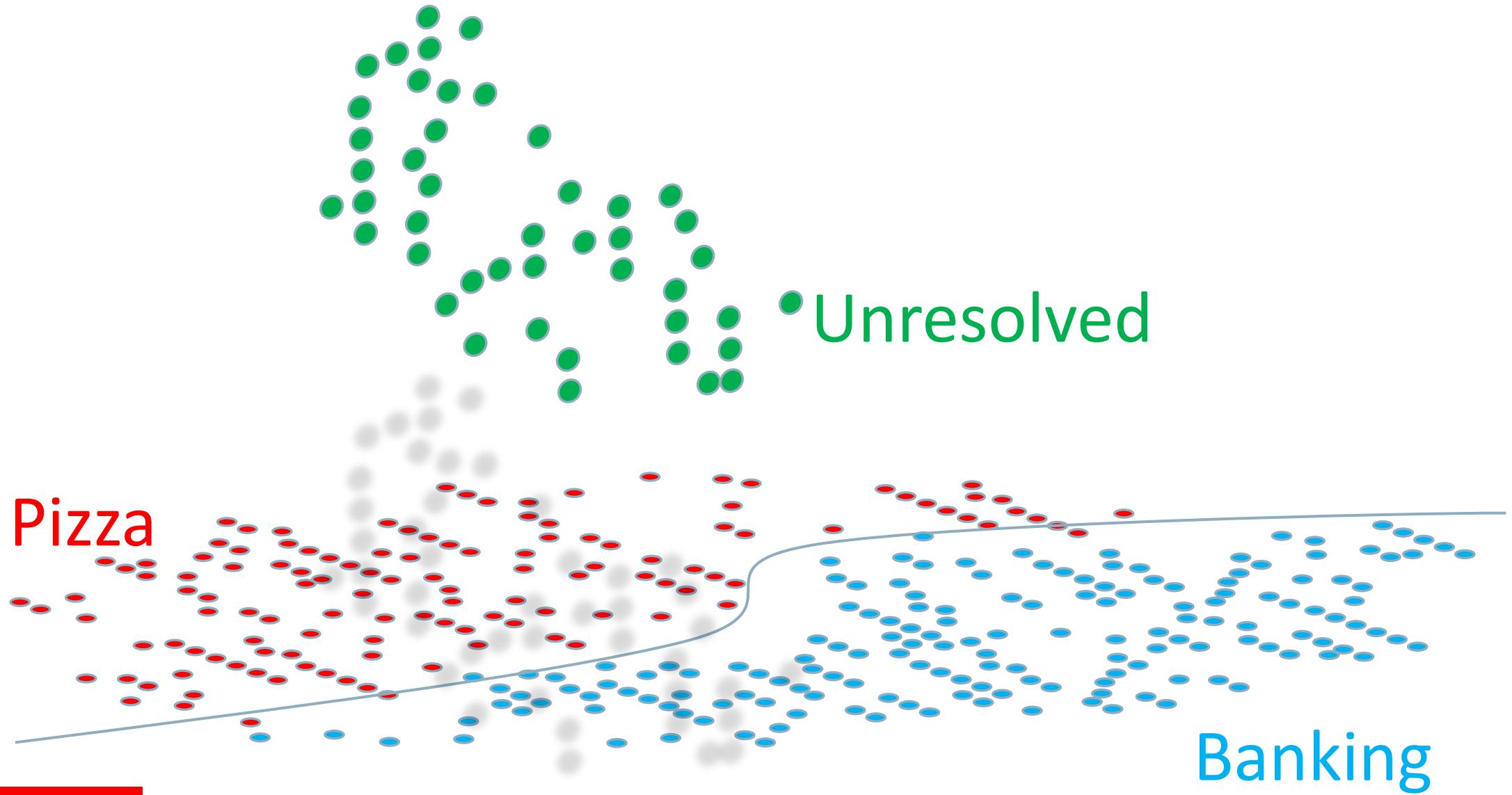
If your bot is only trained to know about **two possible intents**, then it will try to resolve any input to **one of those intents**

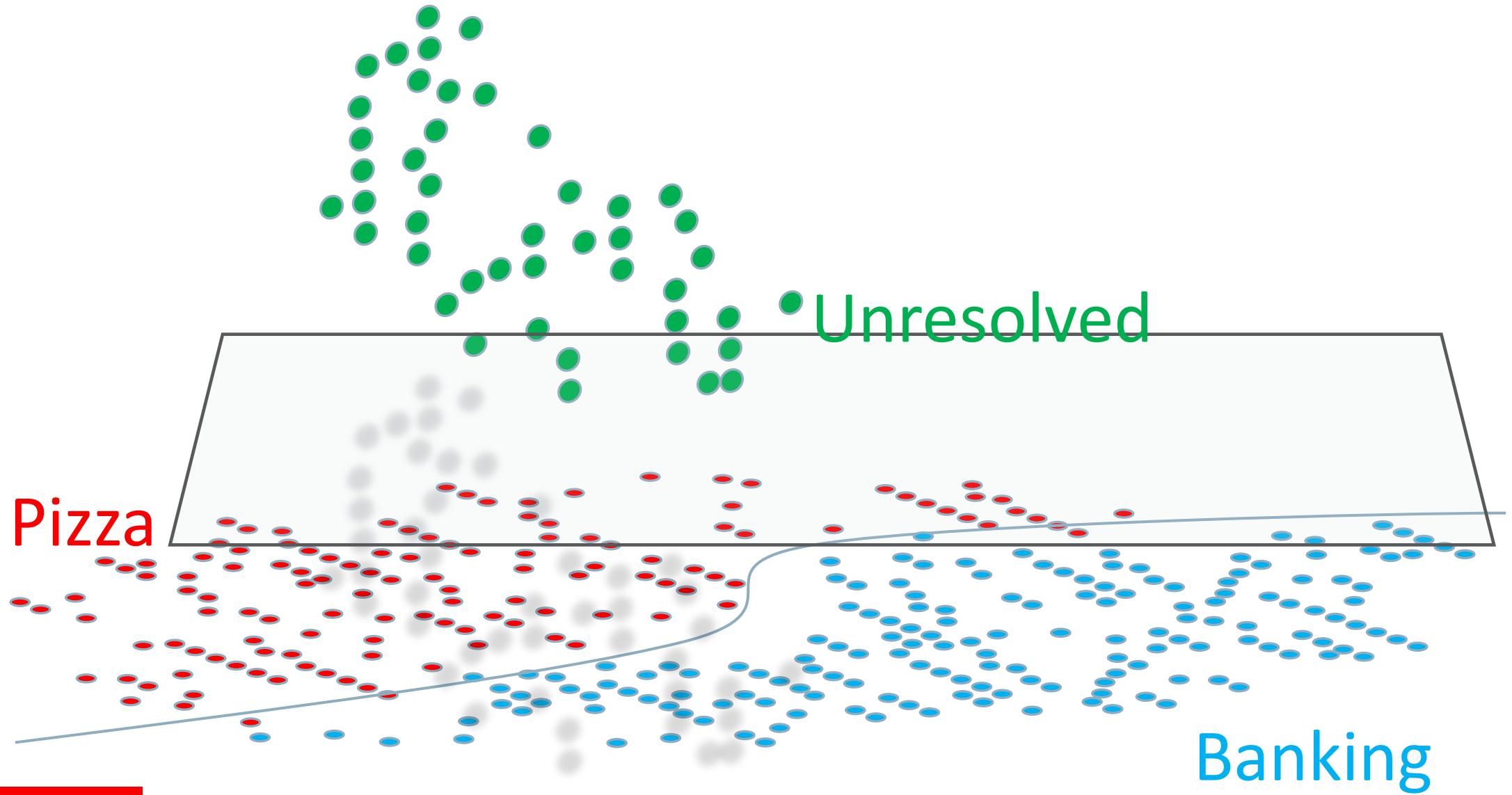


Pizza



Banking



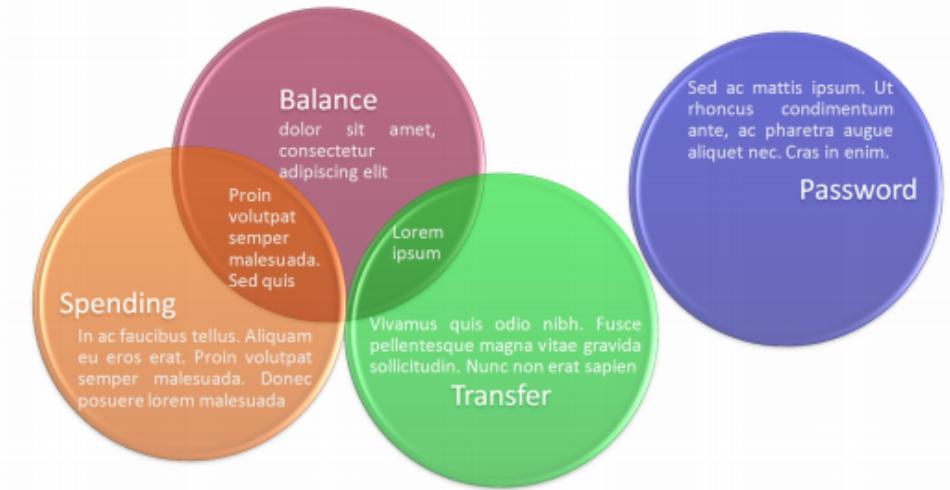


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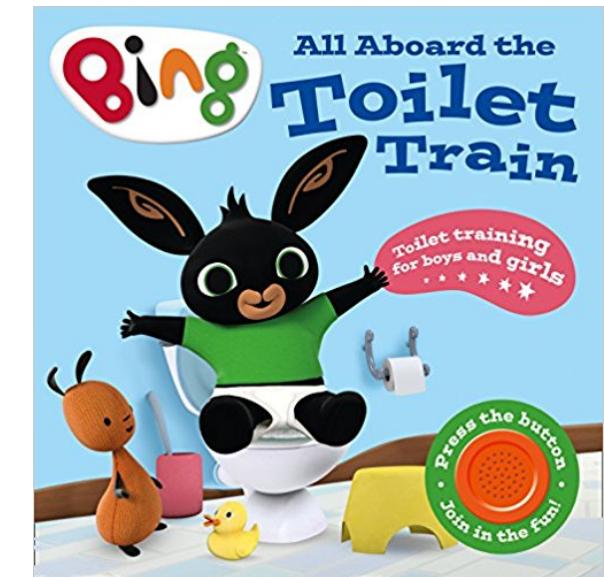
# When synthesizing utterances what makes an intent unique

- 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. home, travel, car insurance
- Extra words can be used to weight utterances
  - But always retest when you do this



# When synthesizing utterances be careful of lexical chrome

- Some words appear across all intents but add no meaning
  - “please”, “thank you”
- Ensure you don’t unintentionally skew results
  - E.g. if one intent consistently uses “please” that can skew results if the user says “please”
- Entity value in training utterances might inadvertently skew intent resolution
  - BOOK\_ORDER\_INTENT “Please order All Aboard the Toilet Train”
  - Incorrectly resolves “Does the train have a toilet”



# When synthesizing utterances consider spelling & grammar

- Don't have to cover every form a word (Trainer Ht)
  - Different forms of a word are reduced to a common root
    - "want", "wanted" / "run" "ran" "running" "runs"
- Sentence structure may aid intent resolution (Trainer Ht)
  - Therefore use grammatically correct sentence where possible
- However, your data should still reflect your users' language
  - "wanna", "gonna", "gotta", "dunno"

# When you see commonality 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

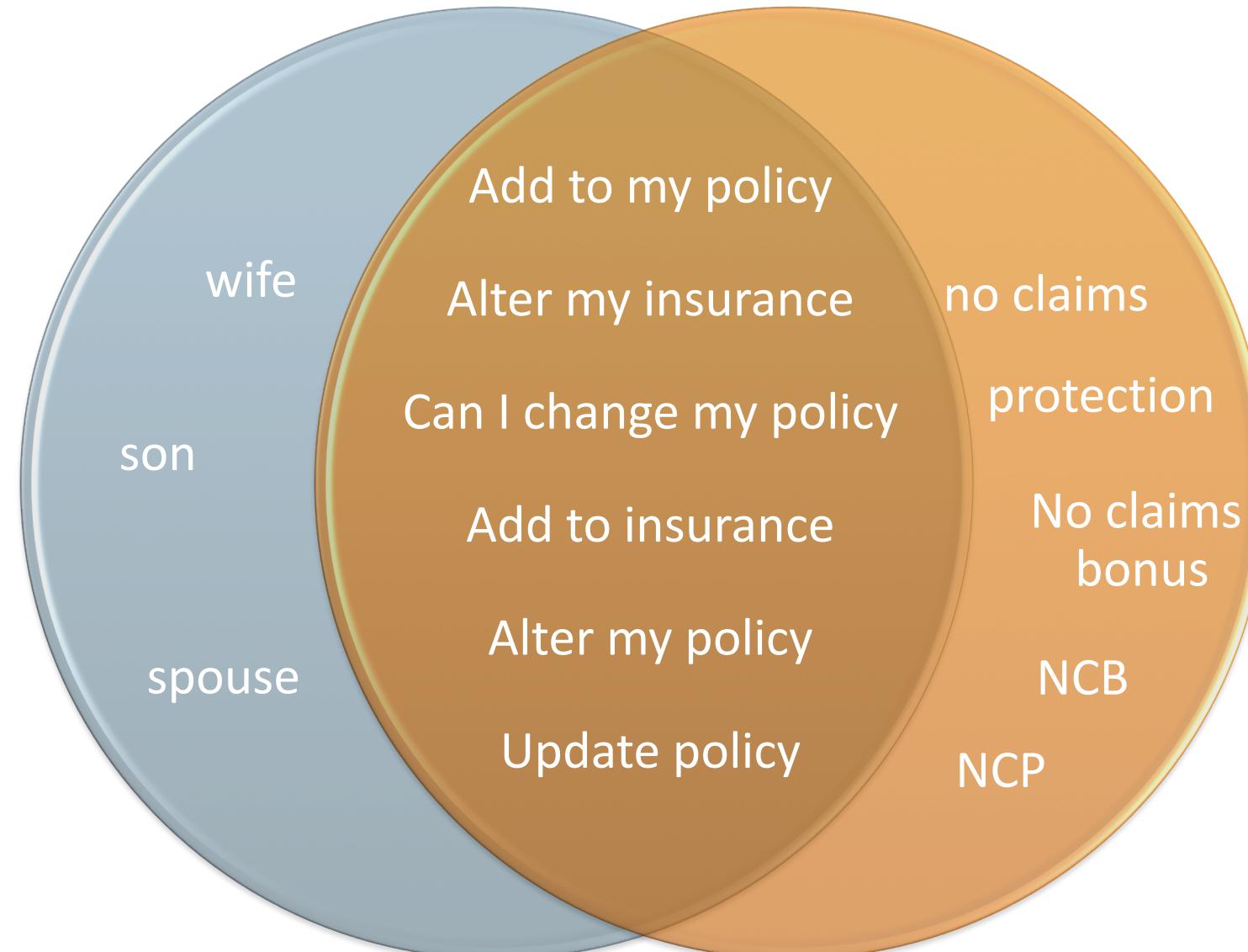
Add no claims protection to insurance

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

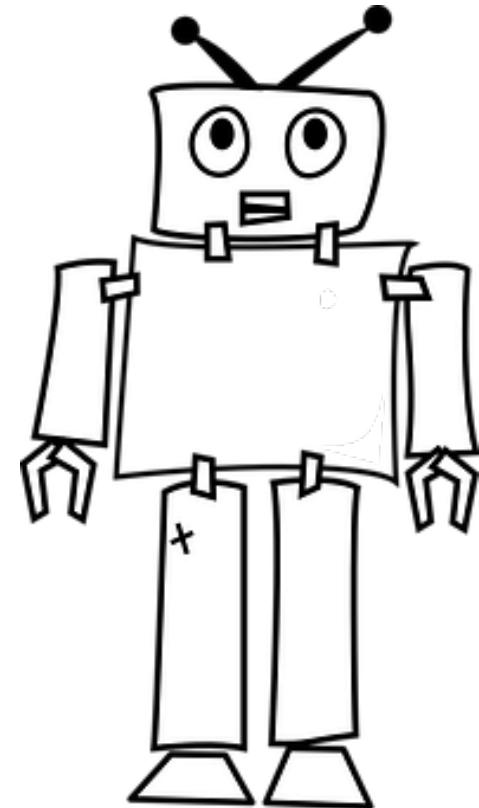
No claims bonus

NCB/NCP

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Databases are **designed**, cars are designed, UX is **designed**. And so **Intents must also be designed**



# General tips for designing intents

- There are no hard and fast rules but:
  - 1 intent is too few, 500 intents per skill is probably too many
  - Don't overuse skills simply to partition, but don't underuse them either
- Each intent should have a distinct use case
  - If you see commonality consider refactoring
- Be “smart” when you train your intents
  - Imbalanced training can cause imbalances results
  - Rubbish in rubbish out

# Good practice for designing intents

- Create intents for things you know skill can't handle but likely to be asked
  - Smalltalk, swearing, common business uses cases not handled by the skill
- A single use case might be implemented by multiple intents
  - Returns policy might be handled by 3 different intents (all execute the same flow)
  - Potentially cleaner classification
  - Opportunity to handle each intent differently in the future
- Consider intent negation – but this is a problem not easily solved
  - "I want to continue my subscription".
  - "I don't want to continue my subscription"
  - "I want to discontinue my subscription"

# Train the unresolved intent

- Capture phrases which your bot should consider unresolved
  - Create unresolvedIntent intent
  - Use this to record any phrases you DON'T want to be resolved to your actual intents
- Analyze bot conversations and train the bot with any malicious/mismatched/rogue input
- Gives the intent resolution engine knowledge of what is NOT an intent

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# Training the digital assistant

- All training guidelines apply to the skill
- DA creates “uber model” – an intent for each skill
  - This helps DA to identify candidate skills
  - The more skills the lower you should consider candidate threshold
- There are only three intents at the digital assistant level
  - Help, Exit, unresolvedIntent for disambiguating help and exit only.
- Digital assistant treats a skill unresolvedIntent in a special way
  - If no active skill, shows all available skills in the DA automatically
  - If a skill is active, the skill’s unresolvedIntent handles the user input
  - You should never be prompted with the unresolvedIntent

Candidate Skills Confidence Threshold

0.4



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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](#)  
 $\leftrightarrow$  [Int\\_Agnt\\_Min\\_Age](#)



[Int\\_Agnt\\_Shift\\_Agncy](#)  
 $\leftrightarrow$  [Int\\_Agnt\\_Shift\\_Cmpny](#)

2



[Int\\_Agnt\\_Min\\_Age](#)  
 $\leftrightarrow$  [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 two sections: 'Similar Utterances' and 'Misclassified Utterances'.

**Similar Utterances:** This section lists pairs of utterances grouped by intent. It includes a 'Rerun Report' button, a 'Show All' toggle, a 'Filter' search bar, and a 'Sort By' dropdown set to 'Quality Ascending'. The first pair shown is 'Int\_Agent\_Monthly\_Statmnt' and 'Int\_Agent\_Periodicity\_Paymnt'.

Utterance	Utterance
Int_Agent_Monthly_Statmnt	Int_Agent_Periodicity_Paymnt
When will i get monthly commission statement	When will i get commission

**Misclassified Utterances:** This section lists utterances with their expected and observed intents and accuracy scores. It includes a 'Show All' toggle. The first three entries are marked with a red exclamation icon.

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 a user interface for quality reporting. At the top, there's a blue header bar with the title "GR\_QualityReports" and several navigation icons: Instant Apps, Validate, Train, and a refresh symbol. Below the header is a toolbar with icons for Utterances, Suggestions, and History, along with a "Rerun Report" button and a "Filter" search bar. A sidebar on the left contains various icons for different report types. The main content area is titled "Suggestions" and displays a message: "There should be 5 or more utterances defined for the Empty Intent intent." Below this message, there's a section titled "Items with Suggestions" containing a single item: "Empty Intent". At the bottom of the main content area, 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' and 'Where All Any of the following are true 2/3/18 - 3/5/18'. Below this, there's a filter for 'Win Margin Is Less Than 10%' with a range from '2/3/18 - 3/5/18'. A green button labeled '+ Criteria' is visible. To the right, under 'Customer Message', there's a list of five messages: 'what do i do once I passed test', 'where can I sit an exam', 'Is there a method for applying to be a specialist on the web', 'can I add my wife', and 'how much to be an agent'. To the right of the messages is a table titled 'Intent Data' with columns for Intent, Win Margin, and Confidence. It shows two rows: 'Int\_Agent\_After\_Exam\_Procedure' with a win margin of 3.9% and a confidence of 18%, and 'Int\_Agent\_Passing\_Marks' with a win margin of N/A and a confidence of 14%. There are 'Export' and 'Search' buttons at the top right of the main area. At the bottom right is an 'Add Example' button.

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

# 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 ×



## Oracle Digital Assistant Hands-On

TBD

**ORACLE®**