

Building a Chatbot

This approach is designed to prove whether AWS Kendra can undertake effective first line interpretation with its Natural Language Processing and provide accurate results to free text questions.

Tools Required

You will require the following tools and documents.

AWS Kendra – provide the natural language processing and free text search / matching capabilities

AWS S3 – Simple Storage Service - Storage bucket for the raw policy documentation PDF's and Q&A source

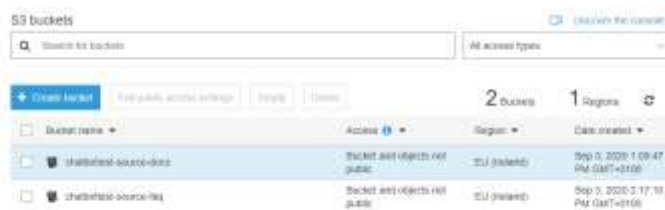
Test policy documents – Fundamental Review of The Trading Book from European Banking Authority, Basel III: Finalising post-crisis reforms from Bank For International Settlements, Benchmark Reform and Transition from LIBOR from ISDA.

Test Q&A file: Excel CSV formatted file with some expected questions, answers, and links

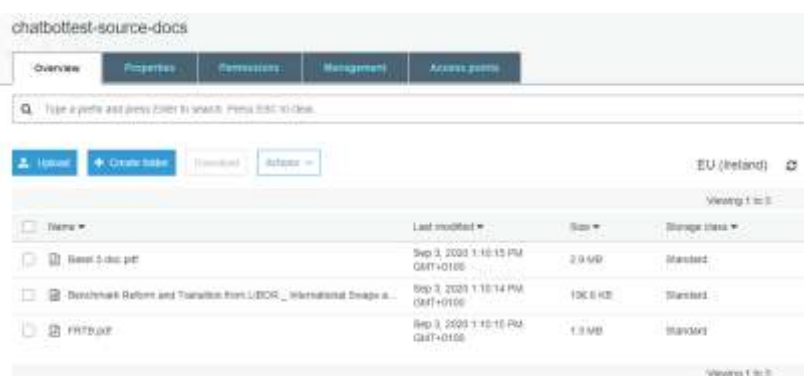
Steps

Step 1: In the AWS Console first select the 'EU (Ireland)' region, a region that supports AWS Kendra.

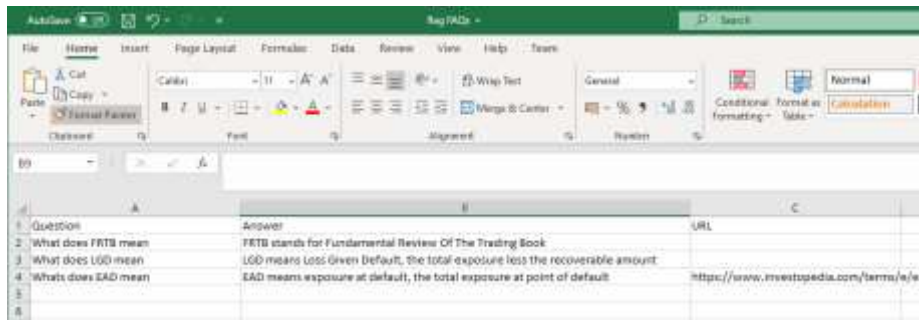
Step 2: In the S3 console, click 'Create Bucket' to create two document stores – chatbottest-source-docs and chatbottest-source-faq



Step 3: Click on the buckets to upload the documents you want to be part of the FAQ



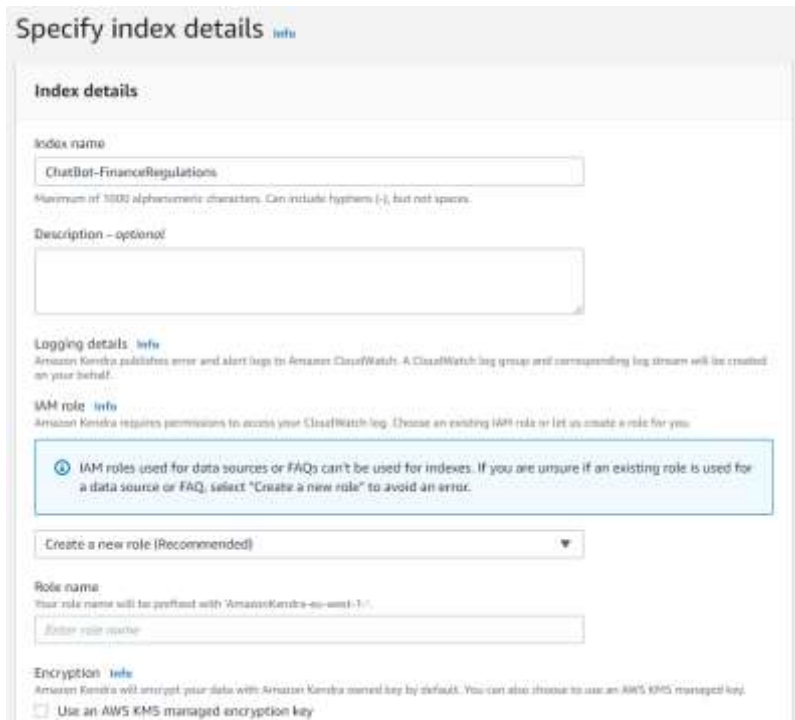
Step 4: Do the same for a sample FAQ as per below and upload into the FAQ bucket.



Q	A	URL
1. What does FRTB mean	Answer	
2. What does FRTB mean	FRTB stands for Fundamental Review Of The Trading Book	
3. What does LGD mean	LGD means Loss Given Default, the total exposure less the recoverable amount	
4. What does EAD mean	EAD means exposure at default, the total exposure at point of default	https://www.mwexpedia.com/terms/e/e2

Step 5: Go to the AWS Kendra service (select matching region Europe in my example) and click 'Create Index'

Step 6: Name your index, here I chose 'ChatBot-FinanceRegulations' and, under IAM role, select 'Create a new role'. Leave all other options for this example.



Specify index details [Info](#)

Index details

Index name

 Maximum of 3000 alphanumeric characters. Can include hyphens (-), but not spaces.

Description - optional

Logging details [Info](#)
 Amazon Kendra publishes error and alert logs to Amazon CloudWatch. A CloudWatch log group and corresponding log stream will be created on your behalf.

IAM role [Info](#)
 Amazon Kendra requires permissions to access your CloudWatch log. Choose an existing IAM role or let us create a role for you.

IAM roles used for data sources or FAQs can't be used for indexes. If you are unsure if an existing role is used for a data source or FAQ, select "Create a new role" to avoid an error.

Create a new role (Recommended)

Role name
 Your role name will be prefixed with "AmazonKendra-eu-west-1-".

Encryption [Info](#)
 Amazon Kendra will encrypt your data with Amazon Kendra managed key by default. You can also choose to use an AWS KMS managed key.
 Use an AWS KMS managed encryption key

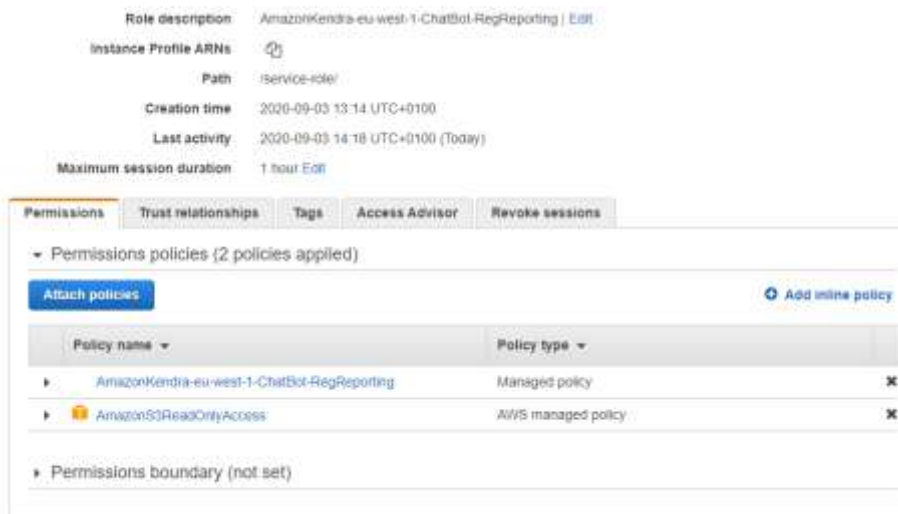
Step 7: This is the only moderately technical part you need to allow AWS Kendra to see the S3 buckets created in the first steps. A sledgehammer approach is to give the new Kendra IAM role (Identity Access Manager) read only access to all of your S3 buckets.

To do this go to the IAM console and select Roles



Role name	Trusted entities	Last activity
AmazonKendra-eu-west-1-ChatBot	AWS service: kendra	Today
AmazonKendra-eu-west-1-lex	AWS service: lex (Service-linked role)	None
AmazonKendra-eu-west-1-support	AWS service: support (Service-linked role)	None
AmazonKendra-eu-west-1-trustadvisor	AWS service: trustadvisor (Service-linked role)	None

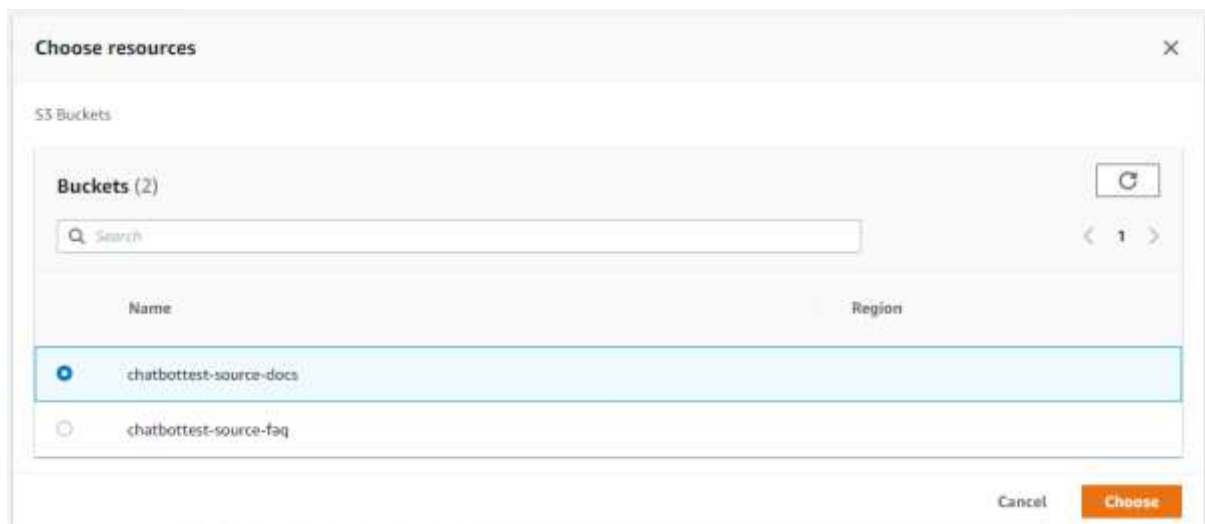
Select the AmazonKendra newly created role and click 'Attach Permissions'. Filter the list by entering S3 and select 'AmazonS3ReadOnlyAccess' to enable, it should look like this once done: -



Step 8: Go back to the AWS Kendra console and select your next Index, then select 'Add Data Sources', then select the Amazon S3 'Add Connector' button.

Step 9: Give your data source a name, I chose 'ChatBot-FinanceRegulations' and select Next.

Step 10: Click Browse S3 and choose you documents directory.



Step 11: Select the AWS Kendra IAM role to match the one created earlier.

Step 12: Choose a 'Set sync run schedule' of 'Run On Demand' and then 'Next'

Step 13: Quick review of your settings and click 'Create' to create the index.

Step 14: Once successfully create a green banner will appear at the top of the screen, click the 'Sync Now' button to fill the index.

Step 15: Go to your newly created index by selecting 'Indexes' on the left and then the name of your index, you should see something like this: -

Index settings			
Name	Status	Creation time	Last modified time
ChatBot-FinanceRegulations	Active	Sep 05, 2020, 1:14 PM GMT+1	Sep 05, 2020, 1:14 PM GMT+1
Description	Data sources	FAQ count	Document count
-	1	4	3
Index ID	Role ARN	Encryption key	Storage used
d17051b9-a1fe-413d-9107- [redacted]	arn:aws:iam::[redacted]:role/service-role/AmazonKendra-eu-west-1-ChatBot-RegReporting	Amazon Kendra owned key	669.36 KB

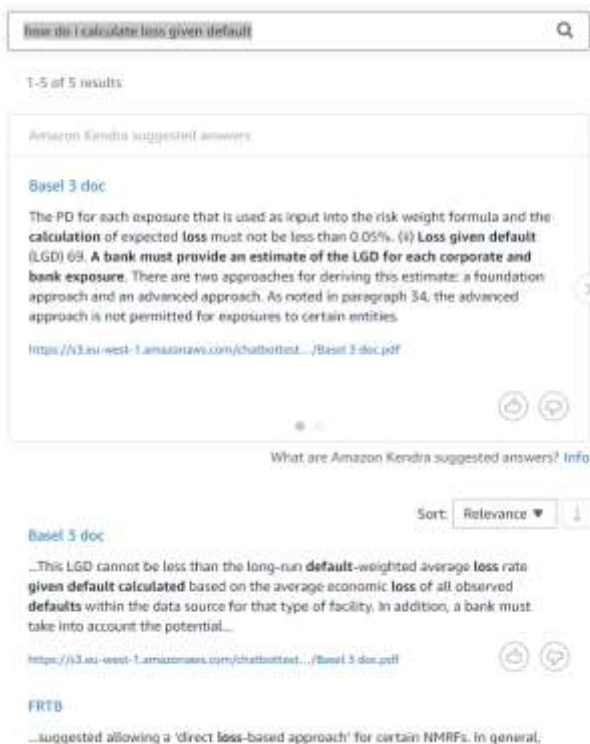
Step 16: Follow the same instructions to add the frequently asked questions by selecting 'FAQs' on the left (the above example I had already loaded these)

The chatbot index is now all complete and ready for use by select 'Search Console' on the left.

Results

Really the testing here is just keep asking questions, but I will pick a select few to give an idea of the power.

- 1) Trying a business specific term and the search capability over the policy documents – 'how do I calculate loss given default' gives the following results: -



how do I calculate loss given default

1-5 of 5 results

Amazon Kendra suggested answers

Basel 3 doc

The PD for each exposure that is used as input into the risk weight formula and the calculation of expected loss must not be less than 0.05%. (4) **Loss given default (LGD) 69. A bank must provide an estimate of the LGD for each corporate and bank exposure.** There are two approaches for deriving this estimate: a foundation approach and an advanced approach. As noted in paragraph 34, the advanced approach is not permitted for exposures to certain entities.

<http://13.eu-west-1.amazonaws.com/chatbottest.../Basel 3 doc.pdf>

What are Amazon Kendra suggested answers? Info

Sort: Relevance

Basel 3 doc

...This LGD cannot be less than the long-run **default-weighted average loss rate given default calculated** based on the average economic loss of all observed defaults within the data source for that type of facility. In addition, a bank must take into account the potential...


<https://13.eu-west-1.amazonaws.com/chatbottest.../Basel 3 doc.pdf>

FRTB

...suggested allowing a 'direct loss-based approach' for certain NMRFs. In general,

Successful start given no training has yet been done on the database. Links and extracts provided into each of the documents and multiple options for people to look for. The thumbs up / thumbs down icon provides training for future answers.

- 2) Check the FAQ with a simple question of 'What does EAD mean?'

What does EAD mean? 



1-5 of 5 results

Amazon Kendra suggested answers

Basel 3 doc


EAD for a revolving purchase facility is the sum of the current amount of receivables purchased plus 40% of any undrawn purchase commitments minus **KDilution**. If the purchasing bank is able to estimate PD in a reliable manner, the risk weight is determined from the corporate risk-weight functions according to the specifications for LGD, M and the treatment of guarantees under the foundation approach as given in paragraphs 70 to 83, 89 to 95, and 107. Advanced IRB treatment 134.

<https://s3.eu-west-1.amazonaws.com/chatbottest.../Basel 3 doc.pdf>



What are Amazon Kendra suggested answers? [Info](#)

Frequently asked questions

Whats does EAD mean 

EAD means exposure at default, the total exposure at point of default

https://www.investopedia.com/terms/e/exposure_at_default.asp

What are frequently asked questions? [Info](#)

Success again but the FAQ source needs to be higher priority here – the link to the definition specified in our FAQ is displayed and we also have the usage in the policy.

- 3) Test the natural language capabilities with the same question different ways – ‘what does EAD stand for?’, ‘EAD what does it mean?’, ‘how do I find out what ead means?’

how do i find out what ead means? 

1-2 of 2 results

Frequently asked questions

Whats does EAD mean 

EAD means exposure at default, the total exposure at point of default

https://www.investopedia.com/terms/e/exposure_at_default.asp

What are frequently asked questions? [Info](#)

All coming back with the correct answer, either as per point 2 or the results above.