


# Automating product Q&A generation

Enabling online stores to easily and reliably populate their product Q&As with a new Q&A system that can automatically generate product questions and answers from existing product information and reviews.

**Product title + description (1 313 words)**      **Customer reviews (29 469 words)**

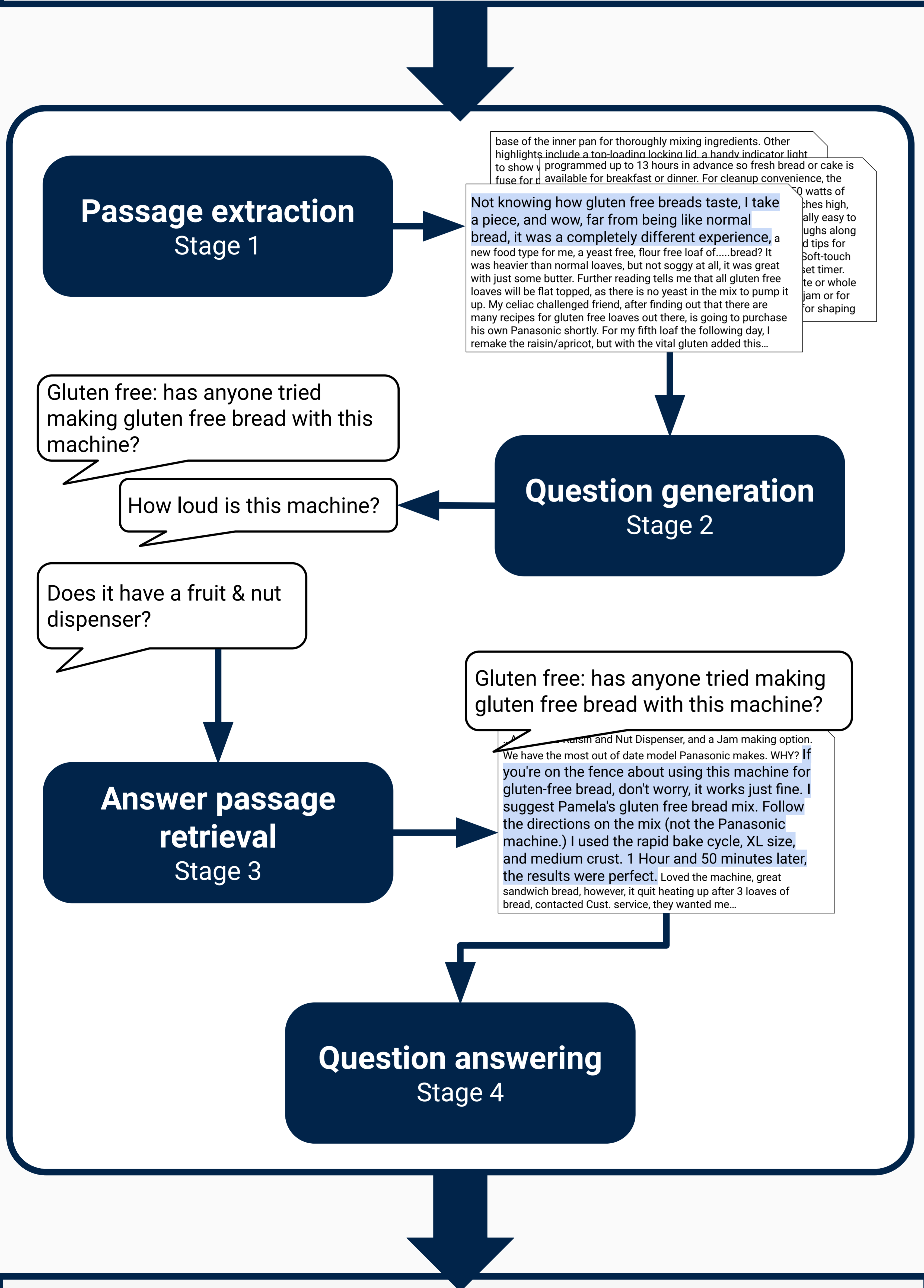


**Automatic Bread Maker with Yeast Dispenser**

Finally, a way to bring back the taste of freshly Baked, homemade bread, without the tiring process that comes with baking it. Baking the perfect loaf doesn't have to be a beating task now that this easy-to-use product has Hit shelves. With an automatic yeast dispenser and 4 baking modes, your bread will rise and BAKE with just a touch of a button, leaving your afternoon free. Cleanup is even easier with the non-stick PAN! fill your kitchen with the familiar smell of fresh bread baking with panasonic's automatic break maker. Providing myriad options, this automatic bread maker embodies the marvels of 21st century electronic convenience and choice. Yes, it mixes, kneads, rises, and bakes bread in three loaf sizes up to 2-1/2 pounds. But its digital controls go much further, offering settings for white, whole wheat, multigrain, and French (crisp crust, open texture) breads, each made according to what's best for that particular style. Other settings permit rapid baking and baking sandwich bread with a soft crust. For raisin (or other dried-fruit) bread, a beeper signals when to add the fruit so it's not crushed during kneading. Crust color—dark or light—can be

I always thought a breadmaker was something you bought, used for a month, and then put in a cupboard never to see the light of day again. To the contrary, once I started making my own bread, the execution is easy, and the thought of going back to store-bought horrible. I have made at least one loaf of bread every. single. week since purchase in Jan 2011. This breadmaker cost a bit more when I bought it, about \$160, so on a per-use basis, it's working out to about \$0.44/loaf. Pretty good. \*\*Update 12/3/17 - my (now) seven-year old SD-YD250 committed suicide by walking off the counter. Yup, it walks from time to time. What a crash it made. I order a replacement immediately and am SO happy that Panasonic is still making them. Literally not a detail has been changed - it was delivered in the same sturdy outer plain cardboard box, with the inner color printed box with the heavy duty copper staples holding it closed, with the exact same literature. It's so shiny and new though !!! How many consumer electronics these days are still being made seven years later ???

We bought this bread maker and the first time we used it something went horribly wrong came downstairs to a smoke filled room a unit that was blistering hot. The machine and the product inside managed to catch fire the inside heat mechanism scorched all the way across. Could have easily started a fire.



Question: Gluten free: has anyone tried making gluten free bread with this machine?  
Answer: I suggest Pamela's gluten free bread mix. Follow the directions on the mix (not the Panasonic machine.) I used the rapid bake cycle, XL size, and medium crust. 1 Hour and 50 minutes later, the results were perfect.

Question: How loud is this machine?  
Answer: sound was easily 2-3x louder than our Bosch dishwasher. Several minutes later, the sound stopped and we were able to go back to sleep. I should explain a bit about of lifestyle....

## Overview

Including product-related questions & answers (Q&As) on product pages is a great way of helping customers with their buying decision. However, due to the complications of collecting Q&A, it is not possible for many stores to reliably populate their Q&As using traditional Q&A systems. Our Q&A generation pipeline solves this by automatically generating product Q&As from the existing product description and customer reviews.

## Q&A generation pipeline

We combine several IR/NLP techniques in a single pipeline that can take arbitrary product information (product title, product description and customer reviews) and outputs a set of product-related Q&As. The different pipeline stages are as follows:

### Stage 1: Passage extraction

- Organise input data into passages of appropriate size

### Stage 2: Question generation

- Generate product-related questions from passages of product information
  - docT5query [1] fine-tuned for product-related question generation task
- Aggregate similar questions to prevent near-duplicates
  - Maximum Marginal Relevance, clustering, word distance

### Stage 3: Answer passage retrieval

- Retrieve a subset of product information passages that are most likely to include an answer for a generated question
  - Dense ColBERT [2] retrieval model, fine-tuned for product-related answer passage retrieval task
  - Using PyTerrier IR framework [3]
- This reduces the input size for stage 4 and thus improves the overall processing time of the pipeline

### Stage 4: Question answering

- Extract answers to a given generated question from passages of relevant product information
  - ALBERT [4] question answering model trained on SQuAD 2.0 [5]
- Apply addition filtering of Q&A results
- Sort final Q&As based on quality

## User evaluation

To evaluate the quality of generated Q&As, we conduct a user evaluation where 10 human assessors blindly assessed 7 Q&A properties for sets of user-written and generated Q&As. The two different sets contain a total of 100 user-written and 100 generated Q&As across 20 different products. Properties are labelled on a Likert 1-5 scale (strongly disagree-strongly agree). Paired t-test with an alpha value of 0.05 is used for significance testing.

Assessed property	% positive (4+)	
	Control	Generated
Question is well-formulated/relevant to product	81%	71%
Question is helpful for buying decision	81%	77%
Answer is well-formulated/relevant*	76%	18%
Answer is helpful for buying decision*	79%	20%
Answer is correct*	78%	14%
Answer length is appropriate*	72%	23%
Q&A appears real*	71%	22%

The user evaluation results are displayed in the table above. The data shown is the percentage of positively scored Q&As (scores 4 or 5) for each assessed property. Properties with significant difference between the control (user-written) and generated group of Q&As are labelled with an asterisk after the assessed property name.

## References

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