Improving Product Question Answering in E-Commerce

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Recuperação de Informação - 2022/23

Product Question Answering (PQA)

Looking for specific info?

🔍 Does this TV have bluetooth connection?   ✕

All   Product Information   Customer Q&A's   Customer Reviews

Connect all your devices - Use the 3 HDMI inputs to connect to cable or satellite and video game consoles. The HDMI eARC lets you add audio equipment for enhanced sound.

Hands-free TV with Alexa - With built-in microphones, just ask to turn on the TV, and find, launch, and control content, so you can put down the remote.

See 6 matches from product info ›

Customer questions & answers

Q: Does this TV offer built-in Bluetooth?
A: Yes it does. You can connect your Bluetooth headset, earbuds. I paired my headphones with my TV, now when I'm watching late at night, I don't bother my family. Hope this helps.
By johnewltrs on July 12, 2022

Q: Is this tv Bluetooth?
A: Yes, this television has bluetooth.
By GeorgeAndy on March 8, 2022

See 20 matching Q&A ›

Customer Reviews

★★★☆☆ **remote and tv difficult to connect**
By Lucille D. Salgado on July 26, 2022
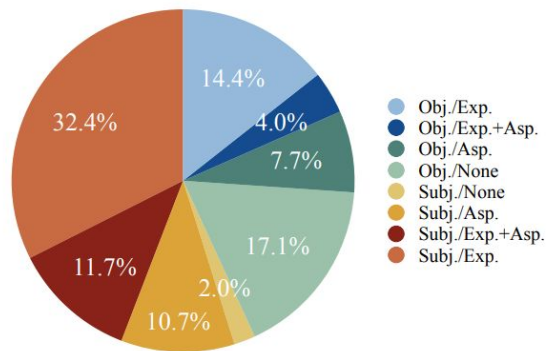Overall to connect the TV to remote and reset failed difficult!

★★★★★ **connecting direct tv controller to tv does not show tv on setup screen**
By Raleigh Benjamin on December 29, 2021
it's hard to connect to direct tv no tv name or model # on set up

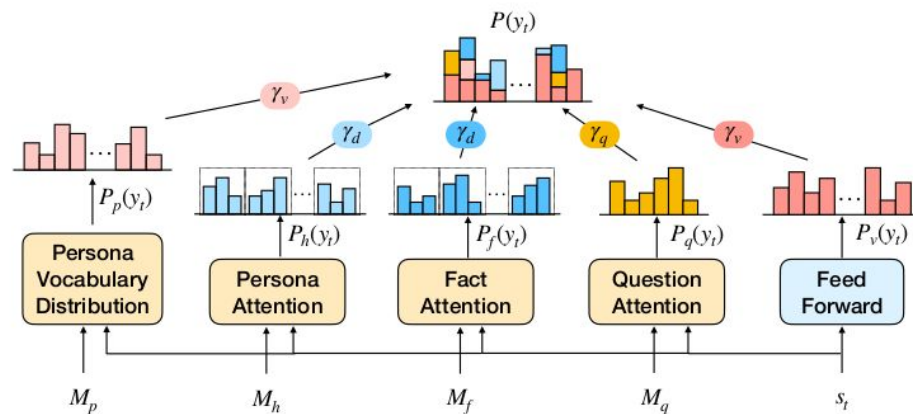See 20 matching customer reviews ›

Personalized Answering GEneration (PAGE)

Subjective questions (56.8%) > Objective questions (43.2%)

80.9% of answers reflect personalized information

Perspectives of user preference: personal experience and product aspects

Persona Information Summarizer module
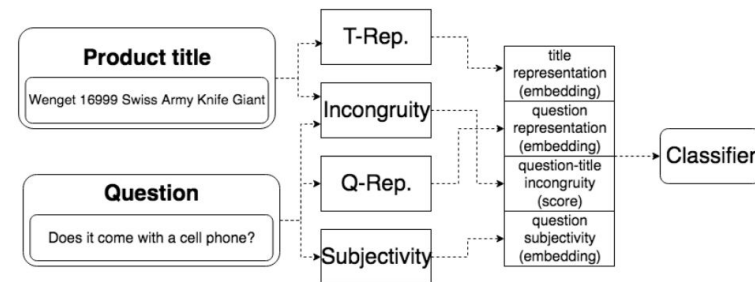
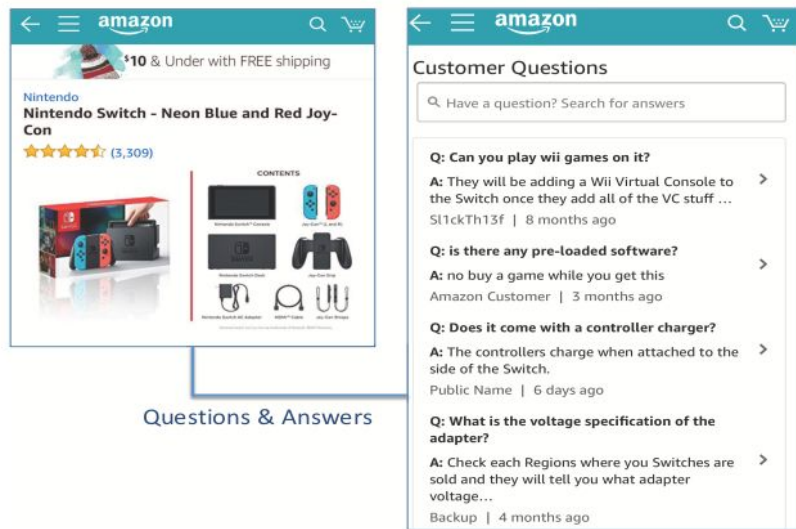*Deng, Y. et al. (2021) Towards personalized answer generation in e-commerce via multi-perspective preference modeling, arXiv.org. Available at: https://arxiv.org/abs/2112.13556.*

Humor Detection in PQA Systems

Product	Image	Humorous Questions	Non-Humorous Questions
Nintendo Switch Gray Joy-Con		• Can i use this to hack into the matrix and save humanity? • Can I trade one of my kidneys? • What if the princess wants to be with Bowser and Mario keeps kidnapping her?	• What do the ports on the side of the console do? • How much money will the system cost? • How do I know if this is the neon or gray version?
Echo Show - 1st Generation Black		• Will this help me find the meaning of life? • Can Alexa show me my future? • Does it cook breakfast?	• Can you see YouTube videos? • Can you see your Echo Show camera on the cloud app? • Can it connect to music speakers?
Sovaro Luxury Cooler		• Will this thing make me fly? It seems due to the price that it has to do something special • Which organ should I sell to finance this ice box? • Just how insecure do you have to be to buy one?	• Will this fit in the trunk of my Lambo? • Where do you plug it in? • What is the country of origin?
Hutzler 571 Banana Slicer		• I set it down in my kitchen, my bananas have stopped talking to me. What now? • What if the banana bends the other direction? • Is there a model for left-handed people?	• Can this be used on cucumbers? • Does it only come in yellow? • Seriously, though - does this thing really work?

Products associated with humorous and non-humorous questions

Humor Detection Framework

Amazon, Y.Z. et al. (2020) Humor detection in product question answering systems: Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval, ACM Conferences. Available at: https://dl.acm.org/doi/10.1145/3397271.3401077.
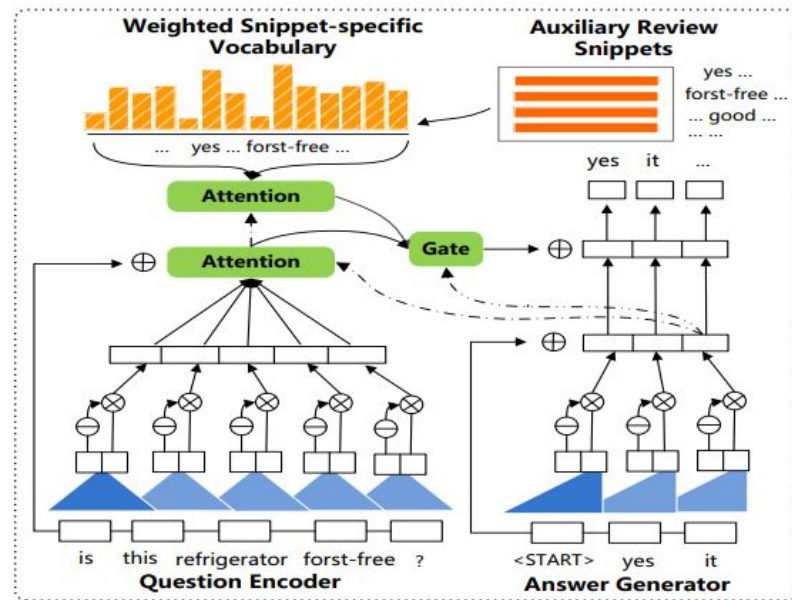
Review-driven Answer GEneration (RAGE)

Example of a product-related community questions of Amazon

RAGE method architecture

Chen, S. et al. (2019) Review-driven answer generation for product-related questions in e-commerce, arXiv.org. Available at: https://arxiv.org/abs/1905.01994.

Results & Discussion

Model	R-1	R-2	R-L	ES-Ext.	ES-Gre.	ES-Ave.
BM25	13.2	1.8	11.7	35.4	66.6	84.7
S2SAR [23]	13.5	2.3	12.5	35.8	65.6	78.9
RAGE [10]	13.2	2.1	12.0	35.6	65.5	80.2
TFMR [47]	14.8	2.5	13.2	36.1	65.1	85.2
Per-S2SAR [66]	14.0	2.5	13.0	35.6	65.5	82.6
Per-CVAE [54]	13.3	2.0	11.9	35.1	63.4	85.0
PAGen [59]	13.5	2.1	12.0	35.5	64.4	84.6
Per-TFMR	15.1	2.7	13.5	36.3	66.9	85.0
KOBE [9]	15.0	2.5	13.3	36.8	67.4	84.9
PAGE	**16.9**†	**3.5**†	**15.1**†	38.3†	67.7†	85.0
- w/o PHI	16.2	3.3	14.5	37.5	67.1	85.1
- w/o PPM	16.3	3.5	14.6	**38.6**	**67.9**	**85.3**
- w/o PIS	15.7	2.8	13.9	37.1	66.6	85.2

RAGE vs PAGE

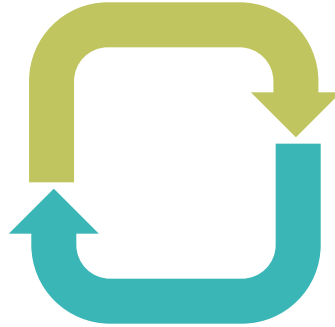| Configuration	Method	unbiased	biased
Baseline Methods	Logistic Regression	82.11	87.21
	Naive Bayes	81.64	87.62
	$LSTM_Q$	83.52	88.59
	CNN_Q	83.26	88.69
Partial Configuration	$LSTM_{Q+T}$	83.42	89.74
	CNN_{Q+T}	83.63	89.58
	$LSTM\_INC_{Q+T}$	83.58	89.8
	CNN_INC_{Q+T}	83.26	90.34
	$LSTM\_SUB_{Q+T}$	83.81	90.08
	CNN_SUB_{Q+T}	83.71	90.23
Complete Framework	$LSTM\_INC\_SUB_{Q+T}$	**84.41***	90.26
	$CNN\_INC\_SUB_{Q+T}$	84.13	**90.76***

Humor Detection PQA

Conclusion

USER PROFILING

Understand and serve customers better

DATA COLLECTION

Retrieving information is the pillar of PQA systems