

# Harnessing the Power of Artificial Intelligence to Improve the Quality of Online Health Forums



DARDEN SCHOOL *of* BUSINESS  
McINTIRE SCHOOL *of* COMMERCE

# YAHOO Q&A EXAMPLE

## **Harnessing the Power of Artificial Intelligence to Improve the Quality of Answers in Online Question-answering Health Forums**

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# ONLINE DIAGNOSERS

- 72% of online users in U.S. look at health information online



- More than one third of U.S. adults try to figure out their medical condition online



# EXISTING ISSUES

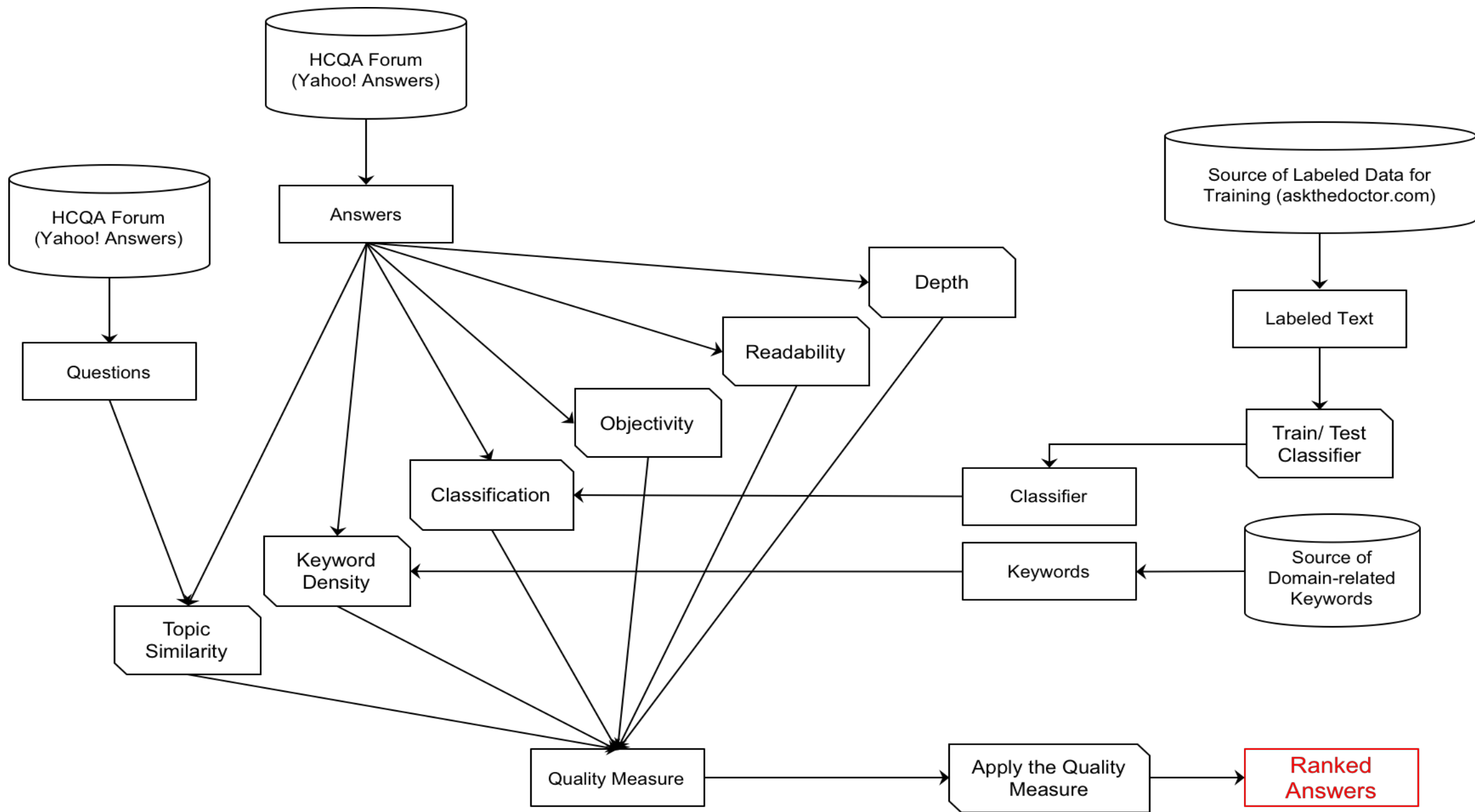
- Poor health advice could result in irreversible consequences and could make the treatment process inefficient
- There is no large-scale mechanism for measuring the quality of health advice online
- Previous studies have little real impact on improving the quality of advice in online health community-based question answering (HCQA) forums

**PART 1:  
HOW TO MEASURE QUALITY  
OF ANSWERS IN HCQA  
FORUMS?**

**PART 2:  
HOW TO IMPROVE QUALITY  
IN HCQA FORUMS?**





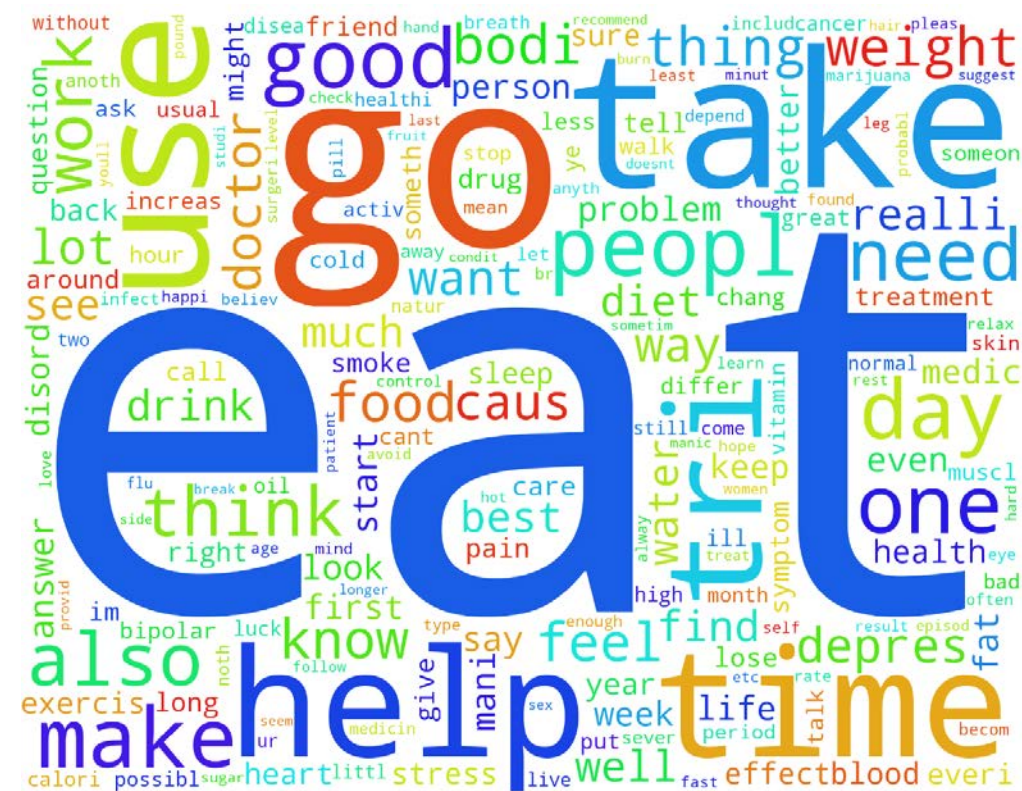
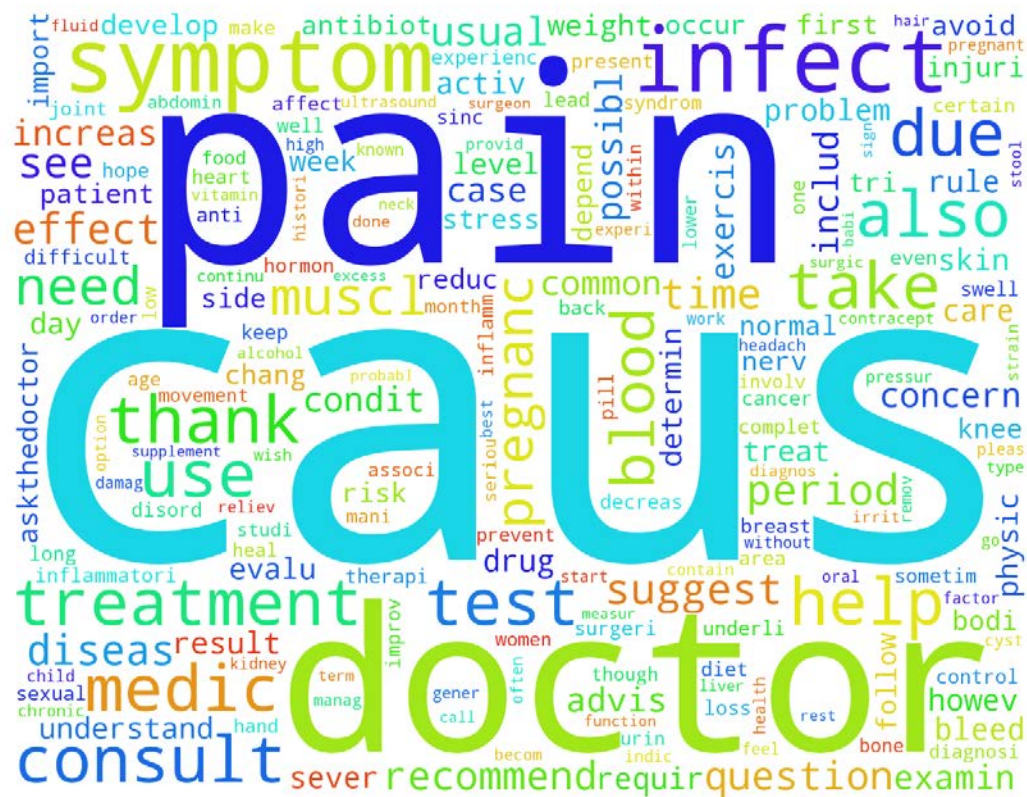


# QUALITY MEASURES

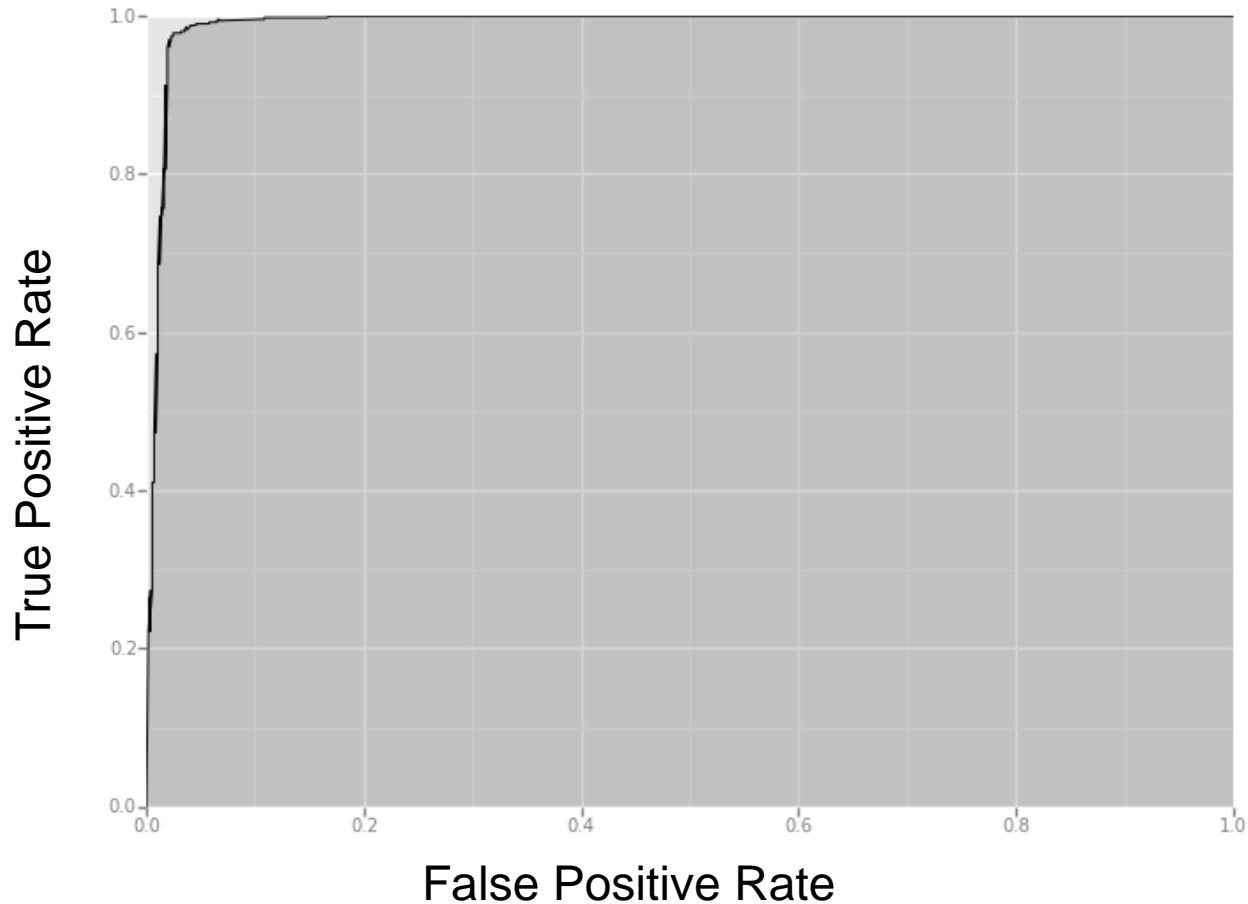
## Measure 4: Classification- Predicted Professional Answers

- Use machine learning to determine if an answer is posted by a healthcare professional or a non-professional
- We collected and used professional answers from [ASK THE DOCTOR?](#)
- We also used out-of-sample answers by Yahoo users who asked a question
- This resulted in two classes: professional and non-professional





ROC Curve with AUC = 94.91



**Confusion Matrix for SVM Classifier (Applied to the Test Data)**

	Pred. Pro	Pred. Non-Pro	
True Pro	560	11	Sensitivity: 98.07%
True Non-Pro	44	466	Specificity: 91.37%
	PPV: 92.72%	NPV: 97.69%	ACC: 94.91%
PPV: Positive Predictive Value NPV: Negative Predictive Value ACC: Accuracy			





# CONCLUSION

- The proposed quality measure could determine the quality of answers.
- The quality of the first answer positively influences the quality of the subsequent answers.
- Experienced answerers are more impacted by the quality of the first answer when they post their own answers.



# IMPLICATIONS

- Most of the HCQA forums can use the proposed algorithm to encourage higher quality answers.
  - Create a reward mechanism based on the quality of answers
  - Sort the answers based on their quality
  - If previous answers are not high quality, hide them or distract the upcoming answerers from those answers
  - Adjust the sorting scheme based on answerers' past experience
  - Adjust the tips and suggestions based on the quality of the first answer.



