Designing Curated Conversation-Driven Explanations for Communicating Complex Technical Concepts

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A World of Buzzwords

The need for learning about emerging technologies and technical concepts among the general population has increased in recent years.

Chilana et al. CHI 16

Non-technical users in professional settings who participate in technical conversations

UX designer

Business Analyst

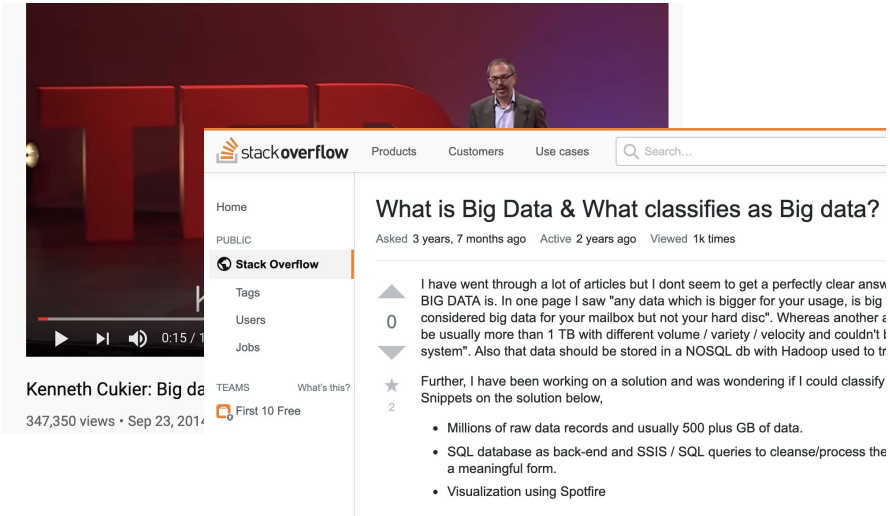
Human Resources

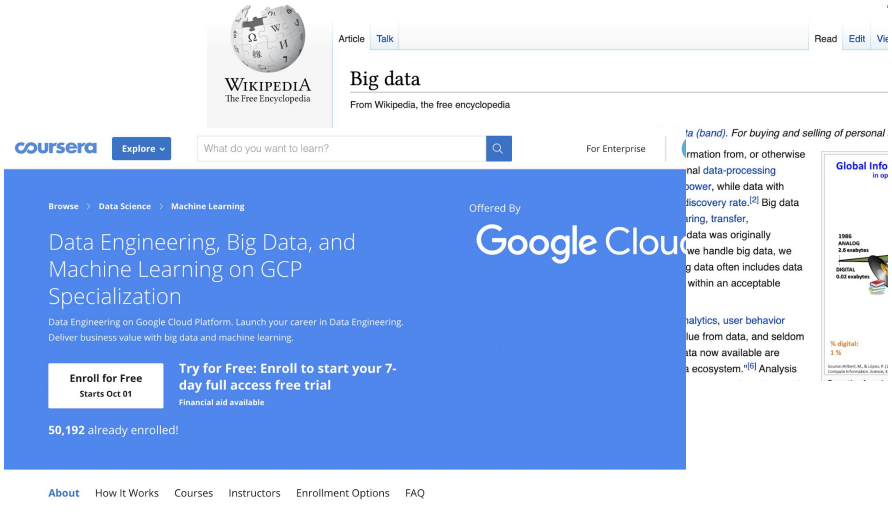
Product Manager

Motivation | Barriers in Learning about Technical Concepts

Alex *business intern*

Learning big data concepts to follow along technical conversation with his seniors

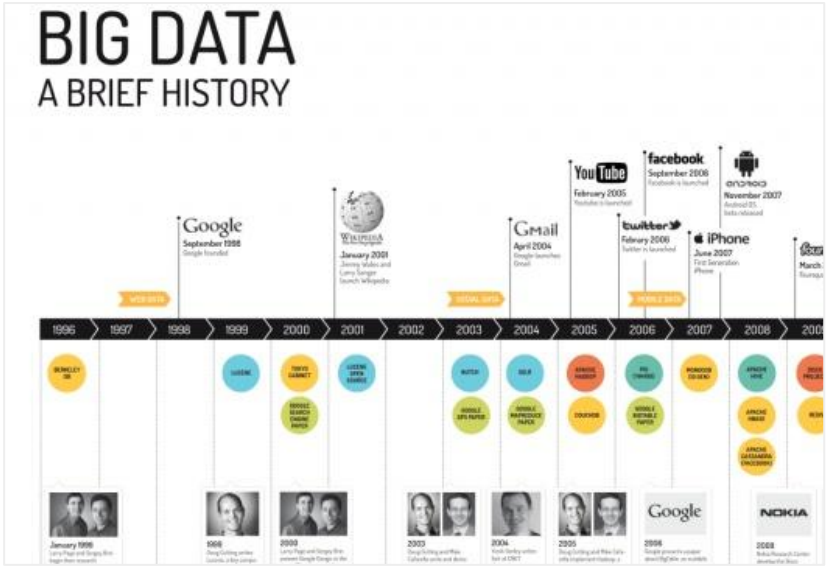


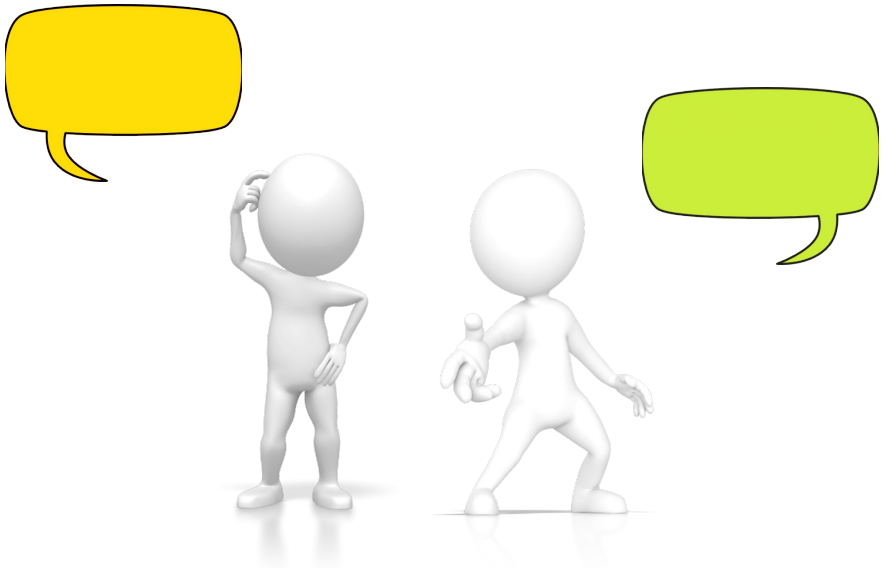


Morden learning resources **fail** non-technical learners!

Wang et al. CHI18

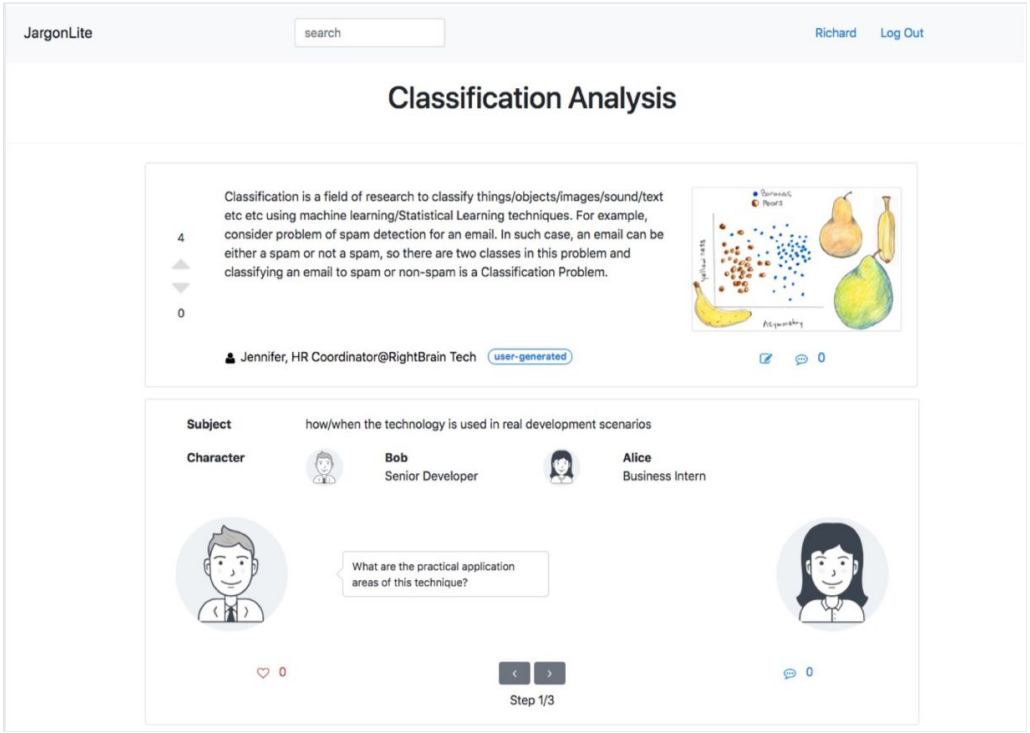
- Takes too much time
- Too much focus on syntax and logic
- Explanations are not relevant

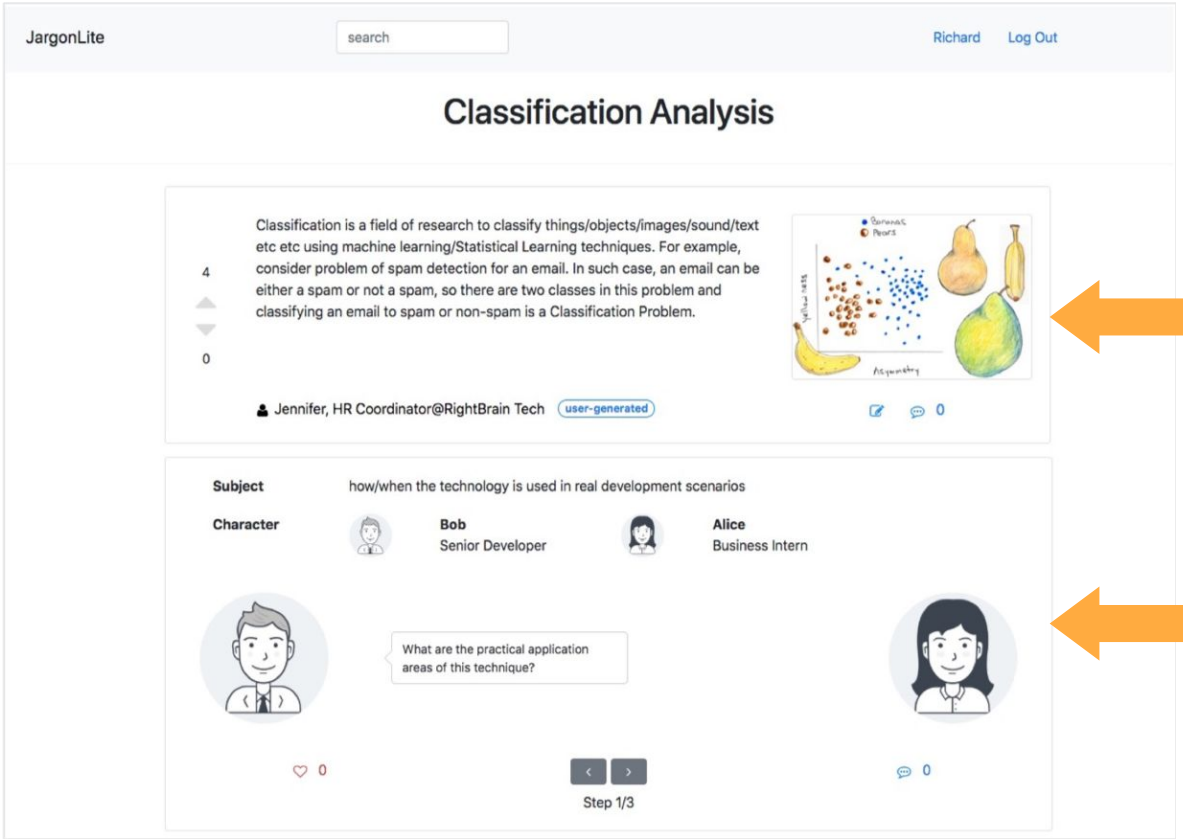

BIG DATA
A BRIEF HISTORY
Google
September 1998
Google founded
Wikipedia
January 2001
Jimmy Wales and Larry Sanger launch Wikipedia
Gmail
April 2004
Google launches Gmail
YouTube
February 2005
Youtube is launched
facebook
September 2006
Facebook is launched
twitter
February 2006
Twitter is launched
android
November 2007
Android 01, beta released
iPhone
June 2007
First Generation iPhone
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Google
NOKIA



What if we could explain a complex technical concept
by providing an **example** of how it can be used in a **conversation**?

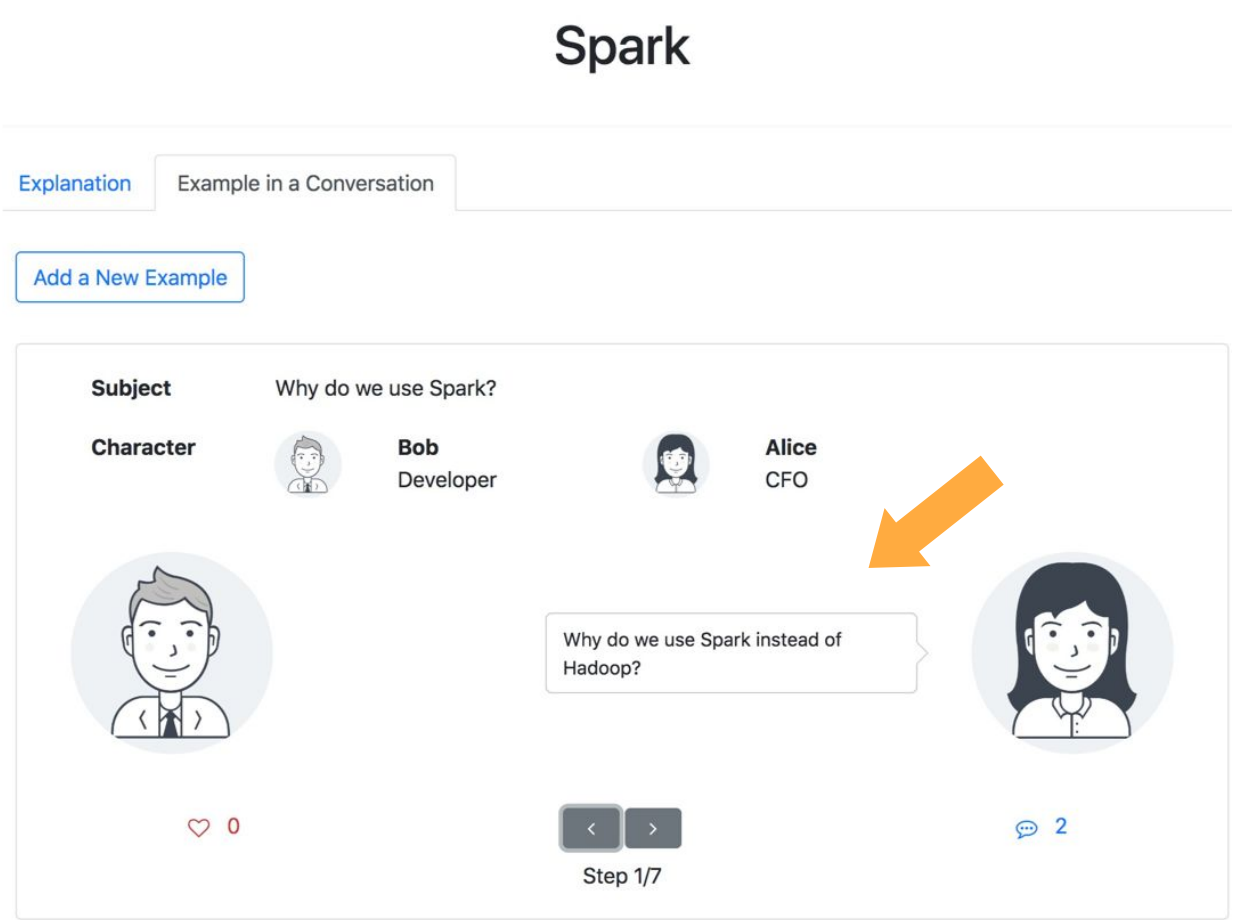
JargonLite is a **conversation-driven** dictionary for technical concepts.

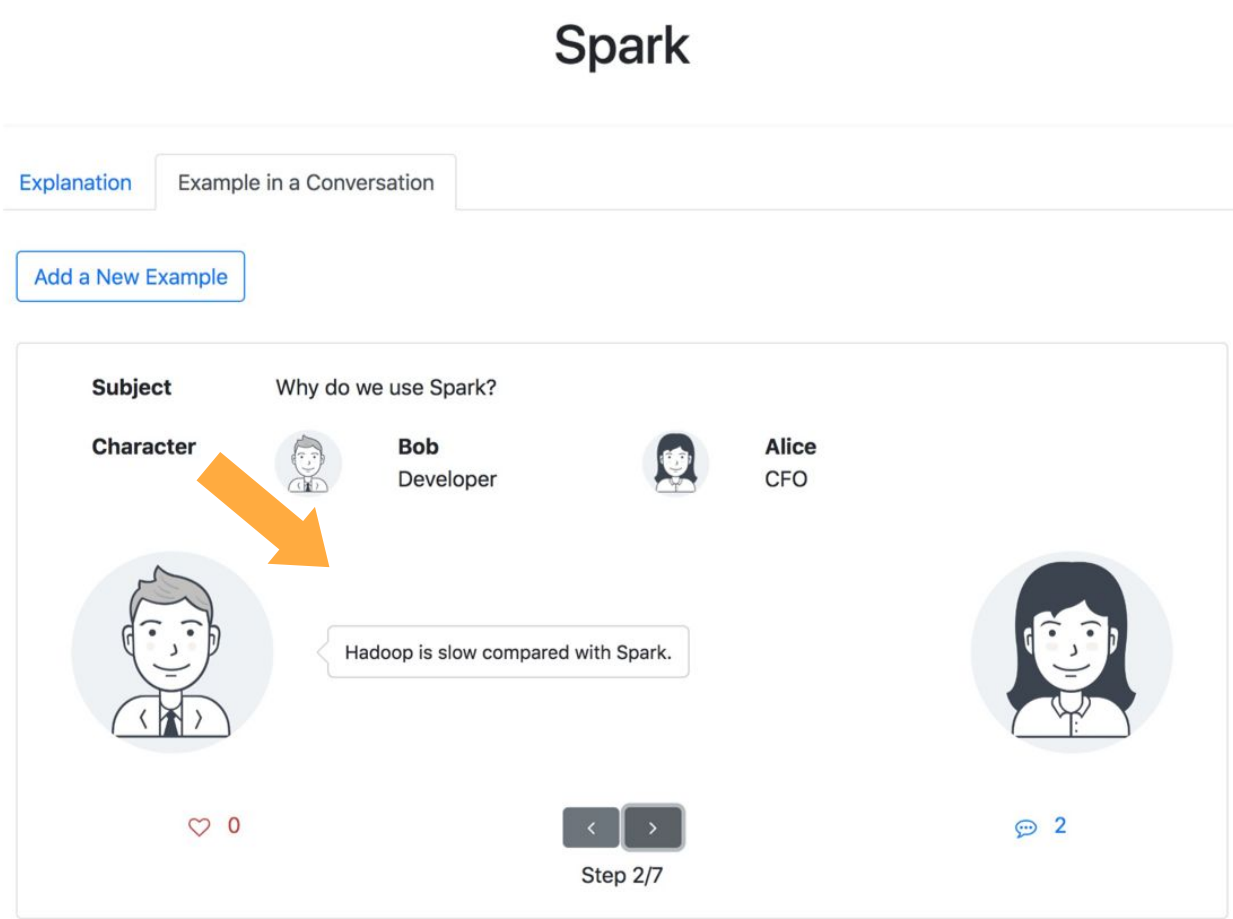


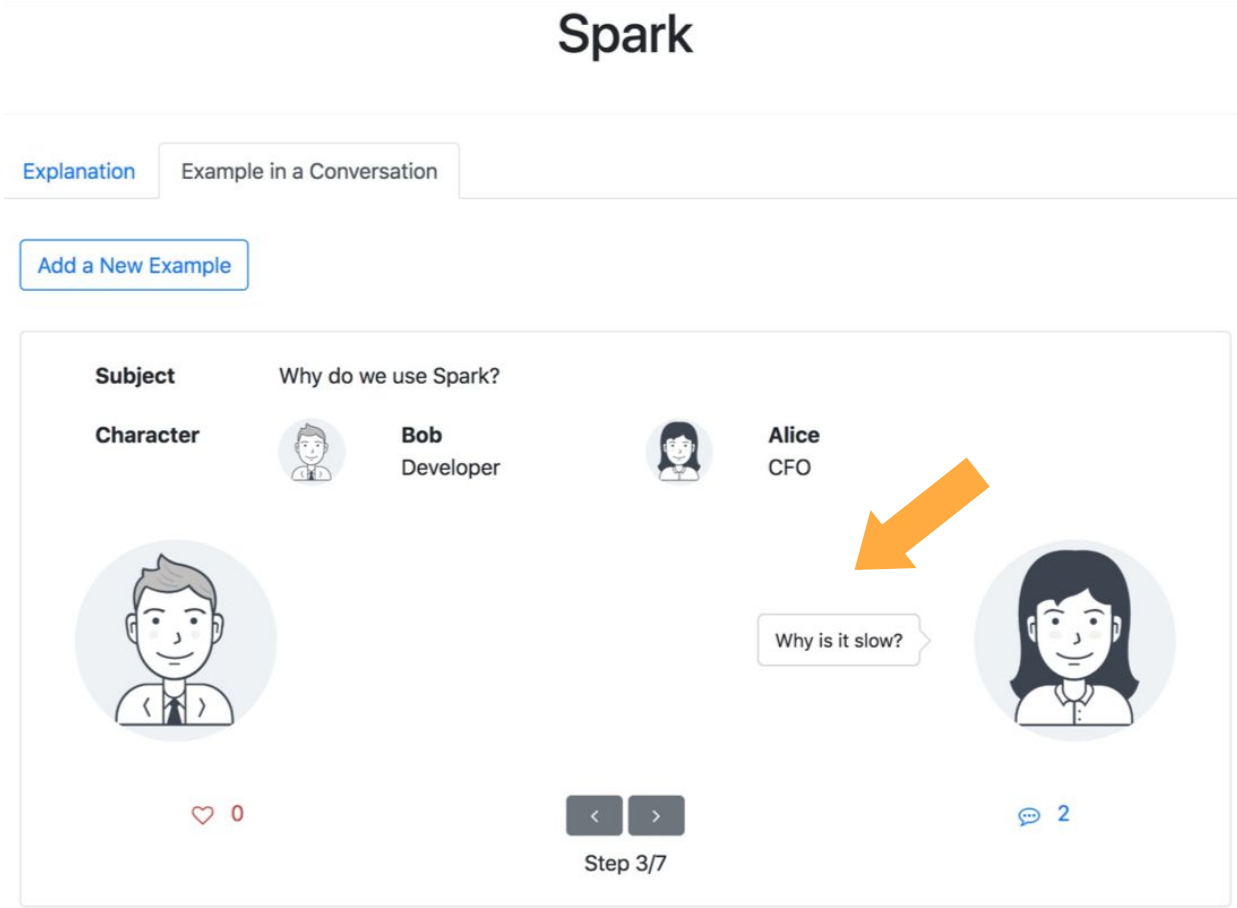


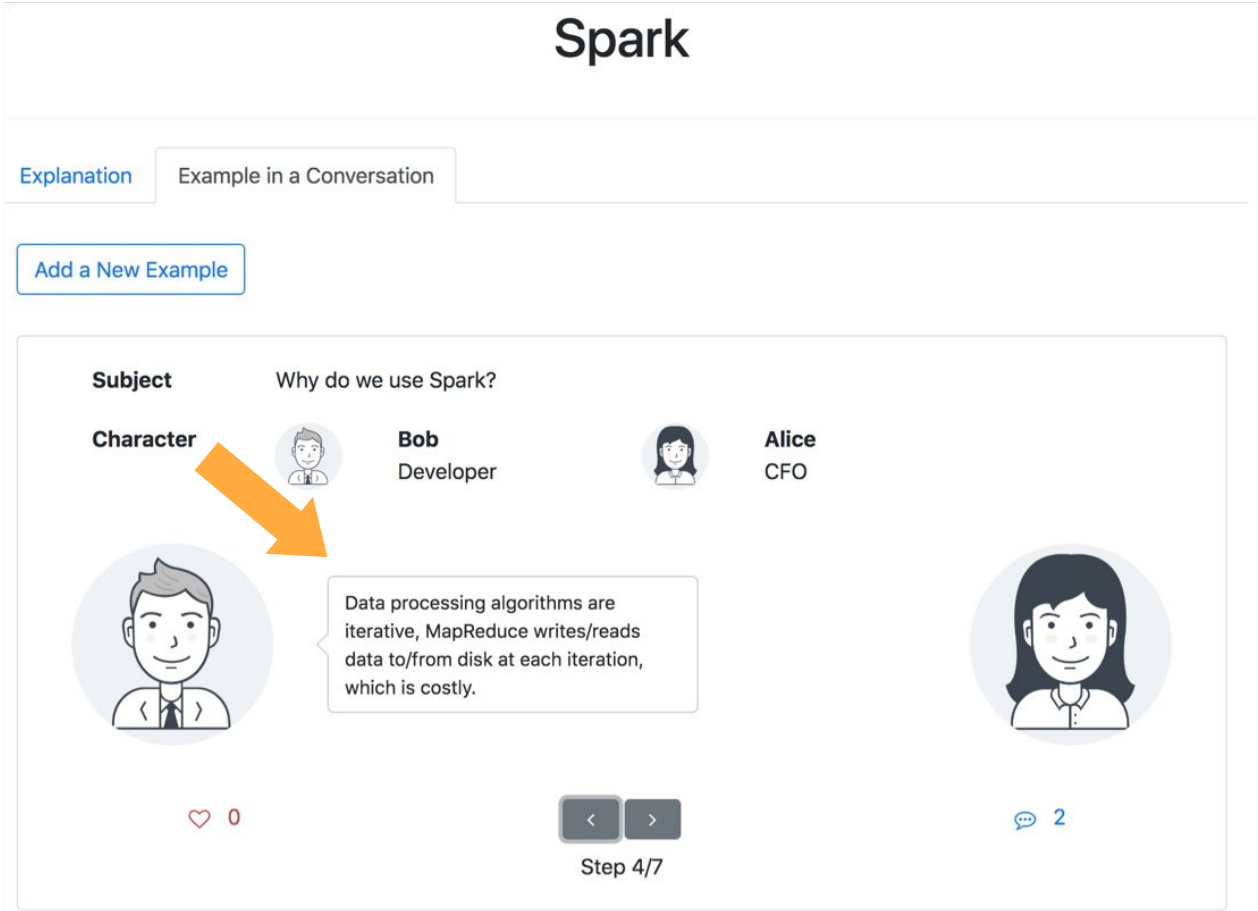
concise and easily “skimmable” explanations added by other users using minimal jargon

a dialogue-style interactive component that explains how the technical concept can be used in a real-world conversation

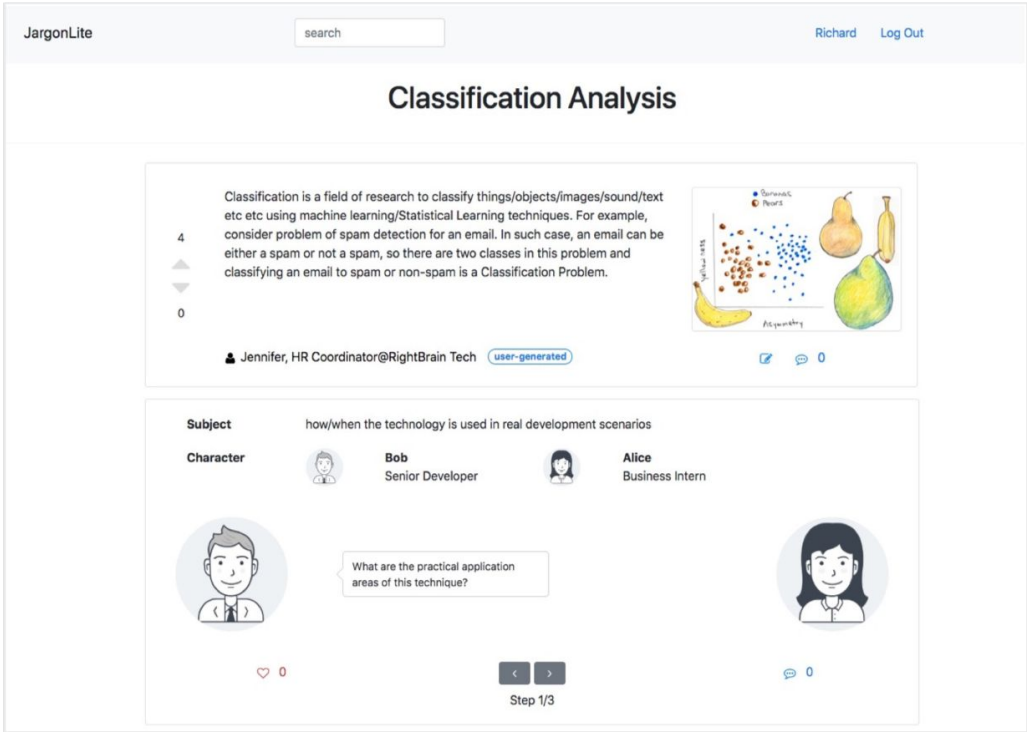

Spark
Explanation
Example in a Conversation
Add a New Example
Subject
Why do we use Spark?
Character
Bob
Developer
Alice
CFO
Why do we use Spark instead of Hadoop?
0
2
Step 1/7


Spark
Explanation
Example in a Conversation
Add a New Example
Subject
Why do we use Spark?
Character
Bob
Developer
Alice
CFO
Hadoop is slow compared with Spark.
0
2
Step 2/7


Spark
Explanation
Example in a Conversation
Add a New Example
Subject
Why do we use Spark?
Character
Bob
Developer
Alice
CFO
Why is it slow?
0
2
Step 3/7


Spark
Explanation
Example in a Conversation
Add a New Example
Subject
Why do we use Spark?
Character
Bob
Developer
Alice
CFO
Data processing algorithms are iterative, MapReduce writes/reads data to/from disk at each iteration, which is costly.
0
2
Step 4/7

JargonLite is a **conversation-driven** dictionary for technical concepts.



Evaluation

Seeding Community-Curated Content

STEP 1

In-Lab Usability Study

STEP 2

Seeding Community-Curated Content

- Picking Big Data Related Concepts
- Simulating Community-Curated Content
  - 6 graduate students from a data science program as contributors

Term (picked for the study)	Number	Term	Number
Data Mining	6	Clustering Analysis	4
Data Visualization	6	Distributed File System	4
Database	6	IoT	4
Hadoop	6	Load Balancing	4
Machine Learning	6	R	4
MapReduce	6	Structured Data	4
Neural Network	6	Data Aggregation	3
NoSQL	6	ETL	3
Spark	6	Metadata	3
SQL	6	Petabyte	3
Classification Analysis	5	Database Administrator	2
Cloud Computing	4	Predictive Analytics	2

In-Lab Usability Study

- 12 participant with little or no technical training
- Each participant was given 6 concepts
- For each concept
  - 3 minutes to check the explanation using the JargonLite dictionary
  - As if they were going to need to use these concepts in a conversation
  - Questionnaire asking perceptions and subjective feelings after each concept
- Post-test interviews

Key Findings

- Ease-of-Understanding
- Maintaining Focus
- Trusting the Explanations
- Perceptions of Conversation-Driven Explanations
- Contributors’ Perspective on the Content Creation Process

- **Ease-of-Understanding**
- Maintaining Focus
- Trusting the Explanations

avg = 3.97

We are trying to communicate [technical] stuff in a simpler way, in a way that general people will understand…they [Wikipedia contributors] seem [to be] already educated in CS for so many years… they may not even realize it themselves, but they are using so many words that people who are not from tech background would hardly understand. (U3)

- Ease-of-Understanding
- **Maintaining Focus**
- Trusting the Explanations

avg = 3.78

I lost focus after reading the first few words from textbook explanations and had to restart from the beginning… [the conversation-driven explanation] … it really kept my interest to read and think. (U1)

- Ease-of-Understanding
- Maintaining Focus
- **Trusting the Explanations**

avg = 4.11

Could be more trustworthy if more information about the contributors could be included!

I wish this system could connect to websites like LinkedIn…to provide me more background of the other users who write the examples. (U6)

Key Findings

- Ease-of-Understanding
- Maintaining Focus
- Trusting the Explanations
- **Perceptions of Conversation-Driven Explanations**
- Contributors' Perspective on the Content Creation Process

Perceptions of Conversation-Driven Examples

- Participants appreciated the conversations because they felt like they could relate to them as personal stories they had already experienced.

  [Here] it's about other people's experience… It's different from a standard explanation by Wiki [Wikipedia]. (U4)

Perceptions of Conversation-Driven Examples

- Different opinions on the style of conversation-driven explanations
  - the intuitive metaphors and long stories that encouraged them to think
  - the shorter, one-sentence “what/why” conversation

Key Findings

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- Perceptions of Conversation-Driven Explanations
- **Contributors' Perspective on the Content Creation Process**

Contributors' Perspective on the Content Creation Process

- The process of adding example conversations is easy (avg = 4.17)

- Willing to contribute towards such a system in real life

  I [build] online reputation when I am answering domain-specific questions on Quora. So, I would totally be willing to contribute to this tool (JargonLite) to enhance my online reputation with other business people, who might be my potential customer or collaborator. (C3)

Contributors' Perspective on the Content Creation Process

- Unsolved problem -- generating an appropriate example conversation can be challenging and open-ended

  For some concepts, it is easy to make comparisons, for example, Hadoop and Spark. Some concepts (e.g., data mining) are very general. It is not clear what the pros, and the cons should be. (C6)

Key Findings from Evaluation

- Ease-of-Understanding
- Maintaining Focus
- Trusting the Explanations
- Perceptions of Conversation-Driven Explanations
- Contributors’ Perspective on the Content Creation Process

Future Work

- Improving Conversation-Driven Explanations
  - Different **formats** of instructions or tutorials for adding high-quality explanations
  - Different **levels of explanations** for different categories of technical concepts?

Future Work

- Conversation-Driven Explanations in Other Domains

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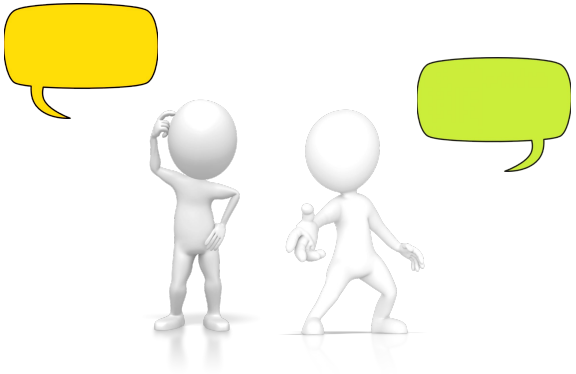

conversation-driven mechanism

Designing Curated Conversation-Driven Explanations for Communicating Complex Technical Concepts

- present a novel approach for explaining technical concepts to non-technical users through the design of conversation-driven explanations

- provide initial insights into how non-technical users can benefit from conversation-driven explanations

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