15th Annual

Meeting of ISMPP

ISMPP International Society for Medical Publication Professionals™

Communicating Science in an Era of Innovation and Change

April 15-17, 2019 • Gaylord National Resort & Convention Center • National Harbor, MD , USA

How Can Artificial Intelligence Be Utilized in Publications?

Presenters: *Ken Truman, Jenny Ghith, and Dheepa Chari*

Moderator: *Todd Parker*

Disclaimer

The views and opinions expressed in this presentation are those of the presenters and do not necessarily reflect the opinions of our employers.

The opinions do, however, reflect our research and professional efforts over the past 15 years.

Agenda

Current Applications of AI

Ken Truman, VP, Insights & Connections, MedThink SciCom

Operationalizing Applications of AI at a Pharmaceutical Company

Dheepa Chari, Team Lead, Global Scientific Publications, Pfizer Oncology

Emerging Applications of AI in Publications

Jenny Ghith, Director, Global Scientific Publications, Pfizer Oncology

Learning Objectives

01 Define key terminology applicable to artificial intelligence (AI) and current applications in health care

02 Operationalize AI initiatives in an organization (prioritize opportunities and get executive buy-in)

03 Identify potential applications of AI in medical publications

CURRENT APPLICATIONS OF AI

Ken Truman
VP, Insights & Connections, MedThink SciCom

> Any sufficiently advanced technology is indistinguishable from magic.

Arthur C. Clarke

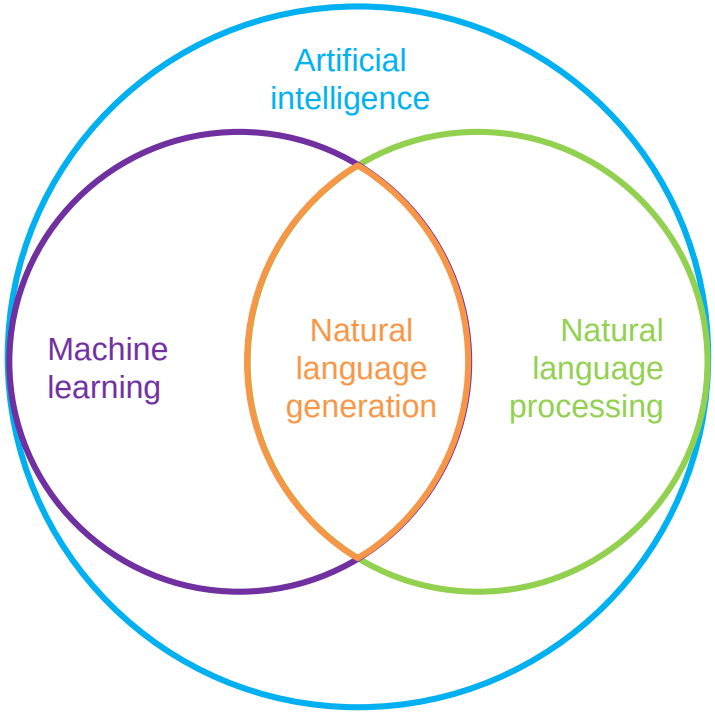
Basic Definitions

Artificial intelligence (AI)
Systems designed to mimic tasks normally requiring human intelligence

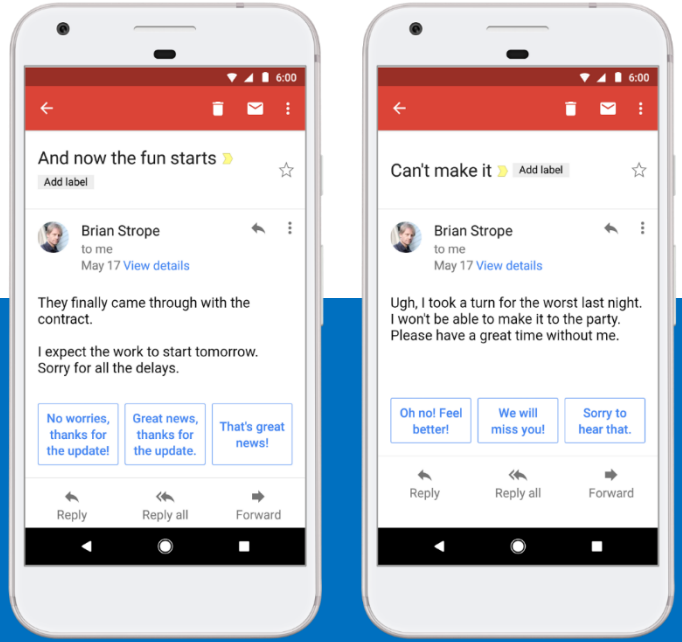
Machine learning
Algorithms that learn from and make inferences or predictions based on data; models improve as more information is available

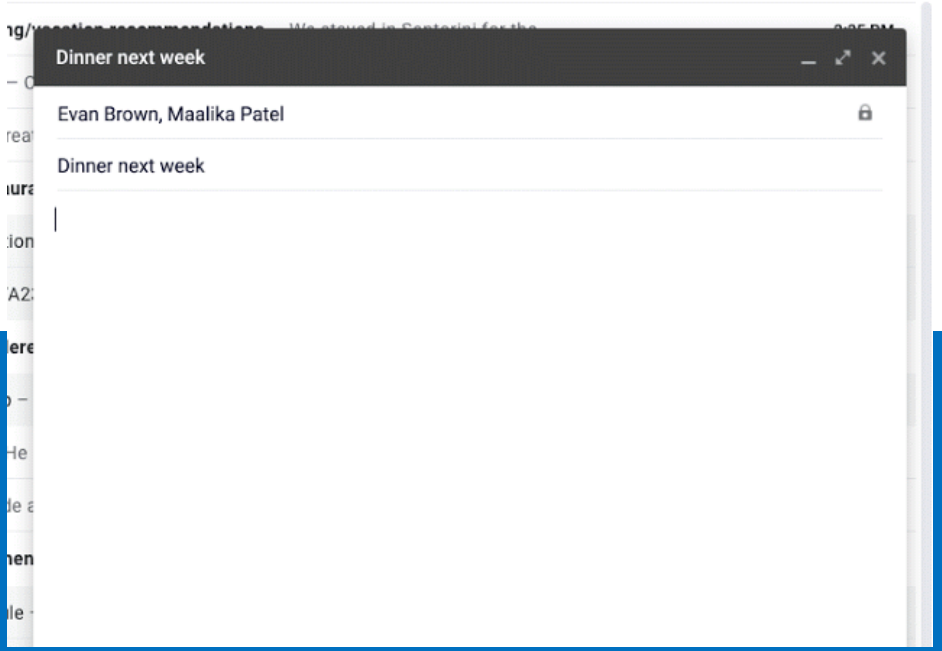
Natural language processing (NLP)
Machine-based processing that allows for human-like interpretation of text

Natural language generation (NLG)
Natural-language processing task of generating natural language from data

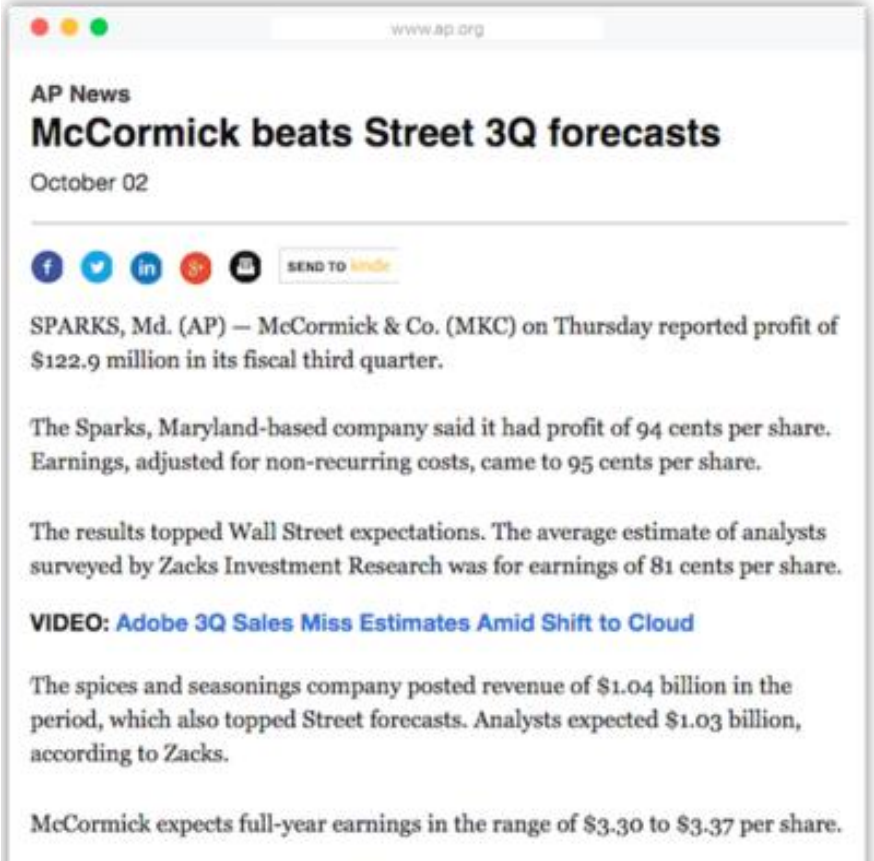


Google Writing Your Emails





Associated Press Earnings Reports



AP News

McCormick beats Street 3Q forecasts

October 02

SEND TO

SPARKS, Md. (AP) — McCormick & Co. (MKC) on Thursday reported profit of $122.9 million in its fiscal third quarter.

The Sparks, Maryland-based company said it had profit of 94 cents per share. Earnings, adjusted for non-recurring costs, came to 95 cents per share.

The results topped Wall Street expectations. The average estimate of analysts surveyed by Zacks Investment Research was for earnings of 81 cents per share.

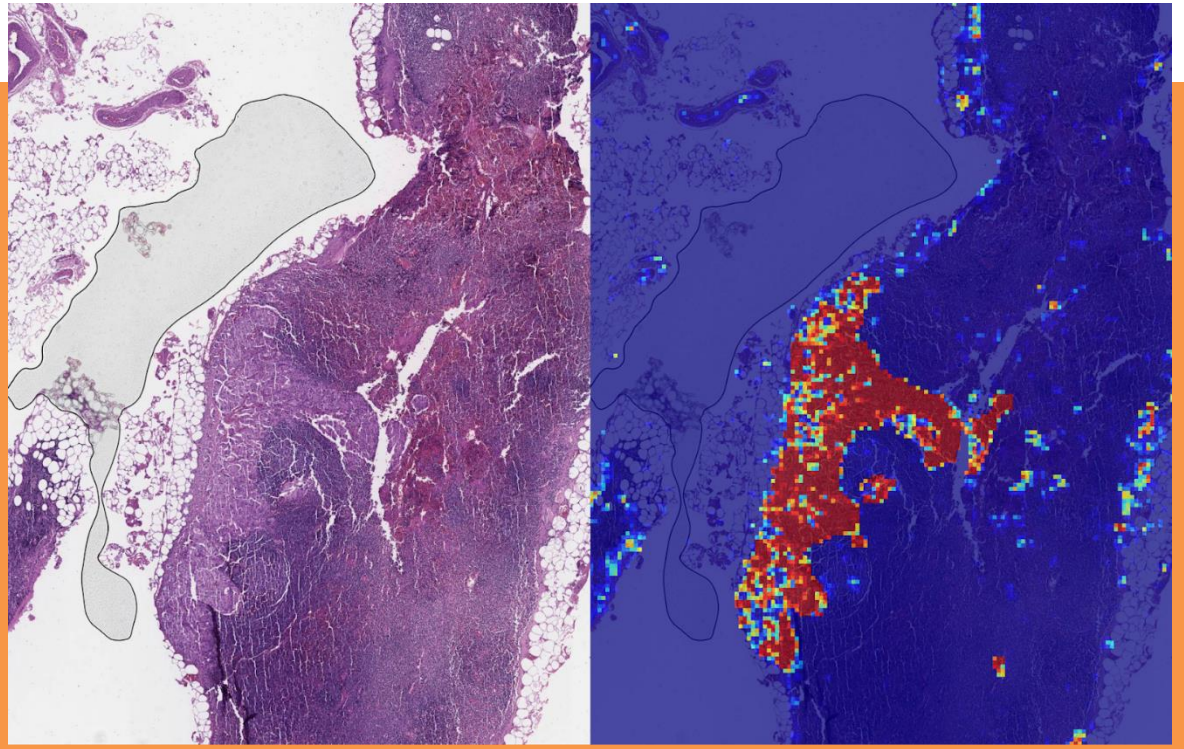
VIDEO: Adobe 3Q Sales Miss Estimates Amid Shift to Cloud

The spices and seasonings company posted revenue of $1.04 billion in the period, which also topped Street forecasts. Analysts expected $1.03 billion, according to Zacks.

McCormick expects full-year earnings in the range of $3.30 to $3.37 per share.

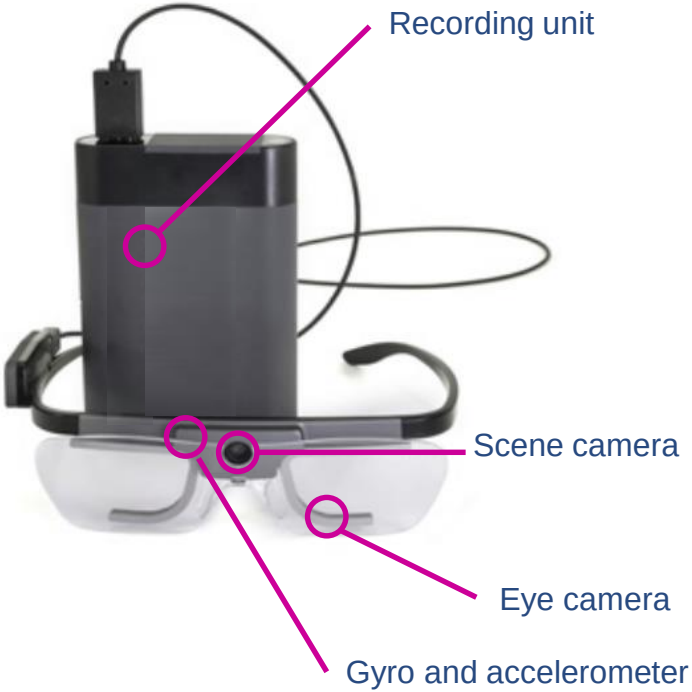
- Every quarter, public companies in the United States release corporate earnings
- Companies like the Associated Press (AP) go through these reports, extracting the relevant financial numbers to compose stories based on these numbers
- Process is time-consuming and not scalable; could only produce 300 stories per quarter
- Using NLG platform, AP can now produce 4400 quarterly earnings stories per quarter

Machine Learning for Detection of Breast Cancer Metastases



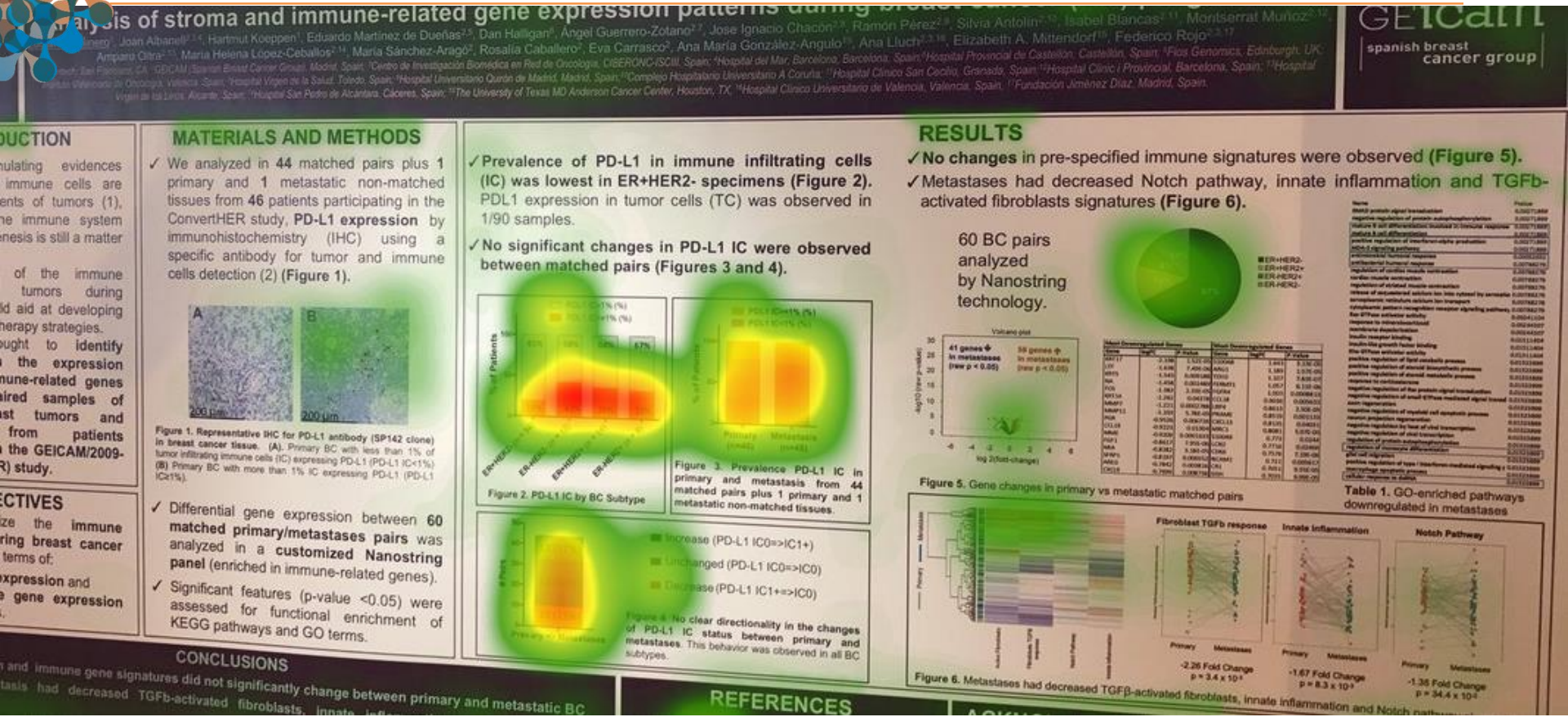
AI Application in Publications: Machine Learning Algorithms Can Simulate Attention

Oculomotor Camera



Machine Learning Algorithms

Predictive Analytics for Effective Poster Design



15TH ANNUAL MEETING OF ISMPP

OPERATIONALIZING APPLICATIONS OF AI AT A PHARMACEUTICAL COMPANY

Dheepa Chari
Team Lead, Global Scientific Publications, Pfizer Oncology

Operational Approach for Selection of AI Initiatives

STEP 1

ASK
relevant question

STEP 2

ACQUIRE
data needed to respond

STEP 3

ANALYZE
to find the solution

STEP 4

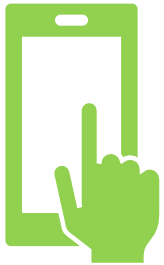
ACT
on key learnings

Identifying Opportunities for AI

INSIGHTS

Detect key patterns and relationships from data in real time to derive deep, actionable insights

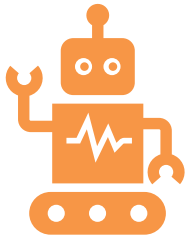
- Gap analyses to identify trends over time
- Systematic literature reviews



ENGAGE

Use mass personalization and influence desired actions to improve customer, patient, and employee engagement

- Digital assistants to answer scientific and clinical questions via lifelike conversations
- Bots to coordinate logistics of HCP interactions



AUTOMATE

Automate repetitive, knowledge- and natural language–rich, human-intensive decision-making processes

- Use AI to detect AE reporting in Medical Information requests
- Automated document review for medical/legal/regulatory

Adapted from: Pizzini. Abstract presented at: Future Pharma; September 26-28, 2018; Boston, MA.

Things to Consider

01 AVAILABILITY

- Are there sufficient relevant data?
- Is there bandwidth on your team to guide the project? Sufficient financial support?

02 VALUE

- Can you articulate the value of the investment?
- What does success look like?

03 EXPECTATIONS

- Is team aligned on maturity of technology and expectations on what is achievable?
- Assuming successful pilot, are you prepared to adapt to new ways of working?

Prioritization of potential initiatives requires alignment with leadership

So Where Should I Start?

01 The growth of big data, advanced analytics, cloud computing, and digital engagement capabilities is creating new opportunities for AI-based approaches

02 Opportunities for AI to solve business problems can fall into one of 3 categories: insights, automation, and engagement

03 Start by asking a business question!

EMERGING APPLICATIONS OF AI IN PUBLICATIONS

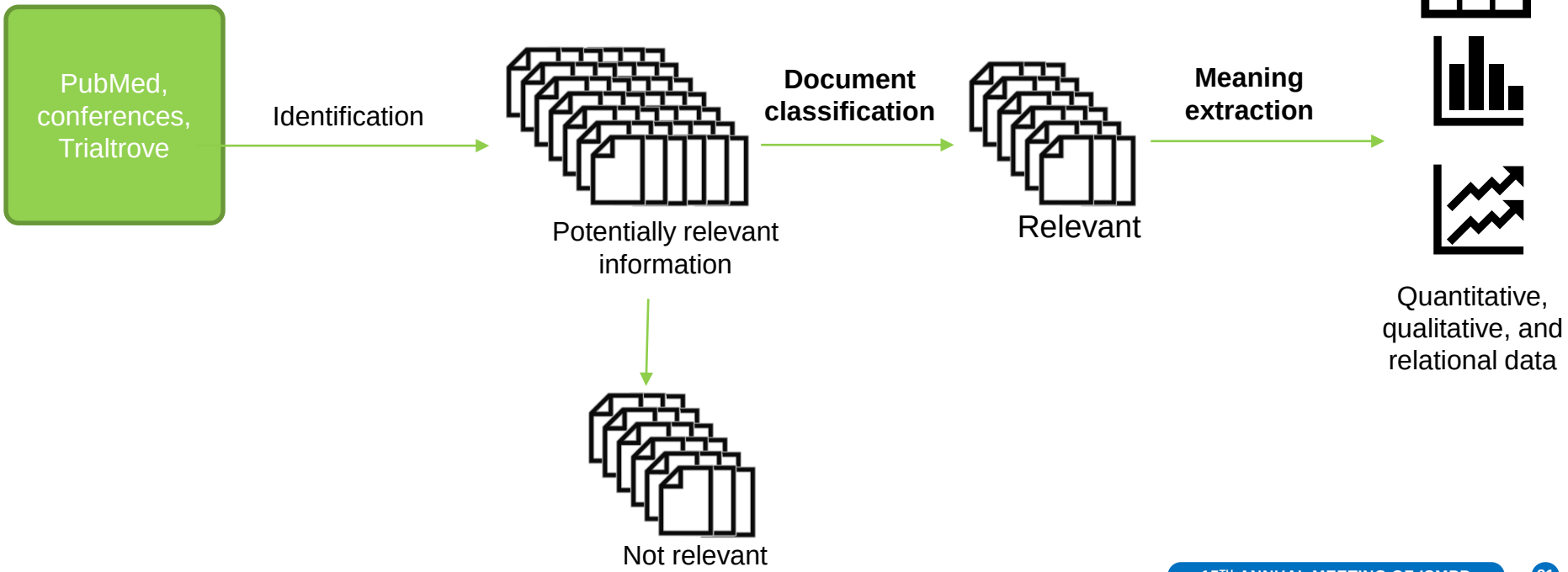
Jenny Ghith
Director, Global Scientific Publications, Pfizer Oncology

Information Overload Exceeds Human Capacity

- 1 million articles per year[1]
- 2 minutes per page[2]

1. Extance. *Nature*. 2018;561:273-274. **2.** Balduino. dzone.com/articles/text-analytics-finding-insights-in-scientific-publ. Published October 26, 2017. Accessed March 18, 2019.

Opportunities for Automation and Insight Generation in Publication Gap Analyses



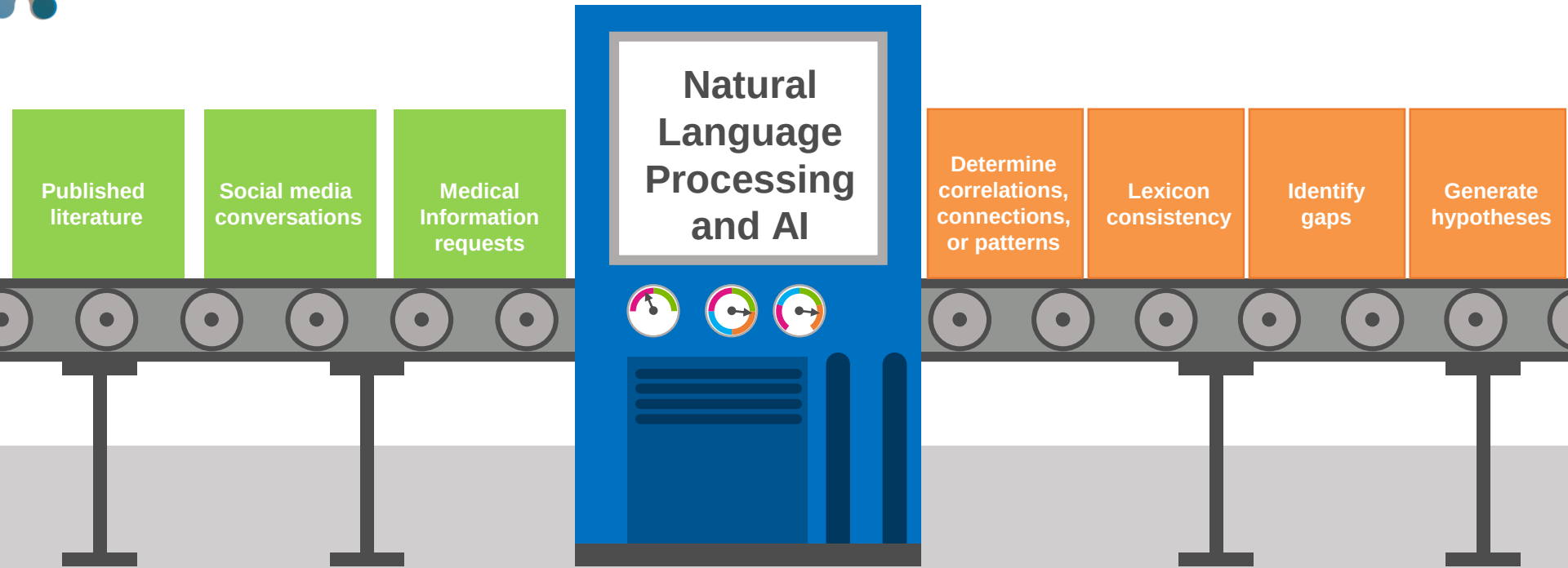
Challenges With Monitoring and Evaluating Progress

Document Classification Results

Predicted	True, no	True, yes
No	True negative	False negative
Yes	False positive	True positive

Overall model accuracy is important, but minimizing false negatives takes priority over reducing false positives

Automated Insights From Content Analysis



Key Takeaways for Use of AI in Publications

01 The technology is here and is already being integrated throughout the industry

02 Leveraging AI has the potential to significantly impact your current practices, increasing efficiency and allowing more time for thinking

03 Understand the strengths and limitations of AI as a tool, but always evaluate through the lens of the business need

Resources

Getting started in AI

- Agrawal A, Gans JS, Goldfarb A. What to expect from artificial intelligence. *MIT Sloan Management Review.* 2017;58(3).
- Extance A. How AI technology can tame the scientific literature. *Nature*. 2018;561:273-274.
- What is artificial intelligence? In 5 minutes. YouTube. www.youtube.com/watch?v=2ePf9rue1Ao. Accessed March 18, 2019.
- Wilson HJ, Daughtery PR, Morini-Bianzino N. The jobs that artificial intelligence will create. *MIT Sloan Management Review*. 2017;58(4).

AI-related education/conferences

- Artificial Intelligence: Implications for Business Strategy (online course). MIT Management Executive Education. executive.mit.edu/openenrollment/program/artificial-intelligence-implications-for-business-strategy-self-paced-online. Accessed March 18, 2019.
- IBM Think. IBM. www.ibm.com/events/think. Accessed March 18, 2019.
- The AAAI Conference on Artificial Intelligence. Association for the Advancement of Artificial Intelligence. https://www.aaai.org/home.html. Accessed March 18, 2019.

Advanced reading

- Magic quadrant for data science and machine-learning platforms. Reltio. www.reltio.com/gartner-mq-report. Accessed March 13, 2019.
- Renganathan V. Text mining in biomedical domain with emphasis on document clustering. *Healthc Inform Res.* 2017;23(3):141-146.

THANK YOU!

Working Session: What Are the Greatest Opportunities in Your Organization?

INSIGHTS

Detect key patterns and relationships from data in real time to derive deep, actionable insights

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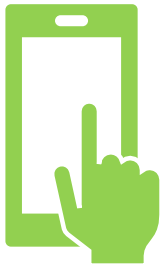

ENGAGE

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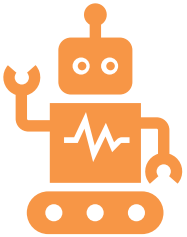

AUTOMATE

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QUESTIONS?

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UP NEXT!

Roundtables

5:15 PM–5:45 PM

Woodrow Wilson Ballroom

ISMPP Member Poster Presentation & Reception

5:45 PM–6:45 PM

Cherry Blossom Ballroom Foyer

BACKUP SLIDES