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How

NLP

is revolutionizing

Marketing and Communications

by SK Reddy
Chief Product Officer AI & ML
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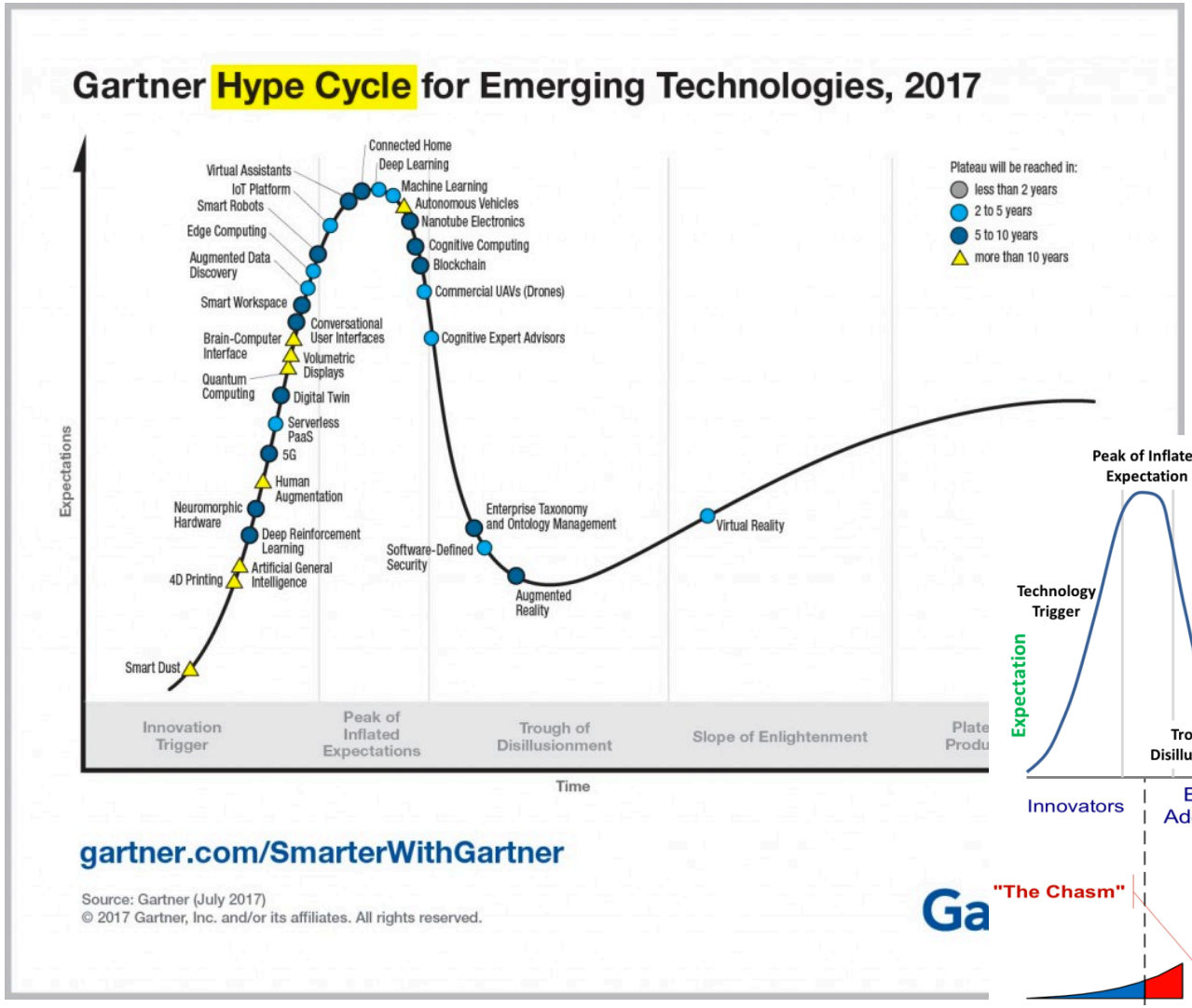
Digitalist (www.digitalist.global)


Gartner Hype Cycle for Emerging Technologies, 2017
Expectations
Time
Innovation Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau will be reached in:
less than 2 years
2 to 5 years
5 to 10 years
more than 10 years
Smart Dust
4D Printing
Neuromorphic Hardware
Quantum Computing
Brain-Computer Interface
Edge Computing
Smart Robots
IoT Platform
Virtual Assistants
Augmented Data Discovery
Smart Workspace
Conversational User Interfaces
Volumetric Displays
Digital Twin
Serverless PaaS
5G
Human Augmentation
Artificial General Intelligence
Deep Reinforcement Learning
Connected Home
Deep Learning
Machine Learning
Autonomous Vehicles
Nanotube Electronics
Cognitive Computing
Blockchain
Commercial UAVs (Drones)
Cognitive Expert Advisors
Enterprise Taxonomy and Ontology Management
Software-Defined Security
Augmented Reality
Virtual Reality
gartner.com/SmarterWithGartner
Source: Gartner (July 2017)
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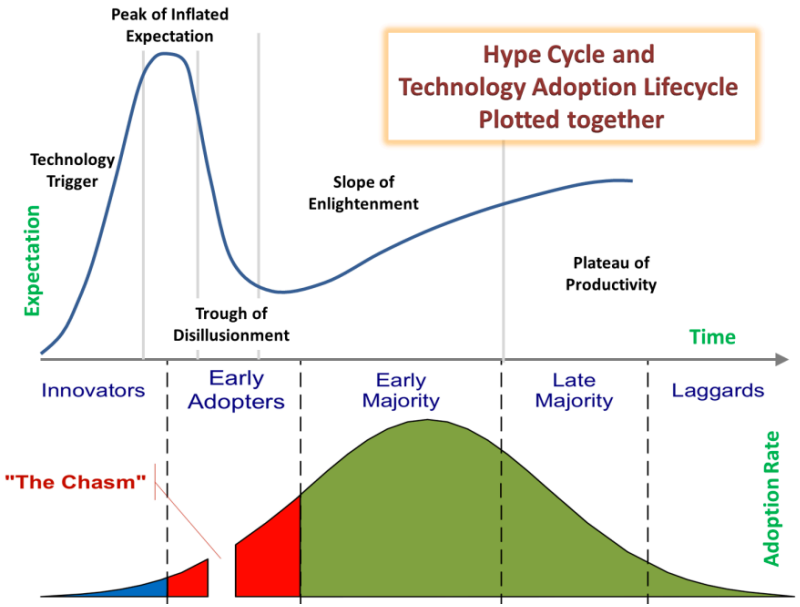
Hype Cycle and Technology Adoption Lifecycle Plotted together
Peak of Inflated Expectation
Technology Trigger
Slope of Enlightenment
Plateau of Productivity
Trough of Disillusionment
Expectation
Time
Innovators
Early Adopters
Early Majority
Late Majority
Laggards
"The Chasm"
Adoption Rate

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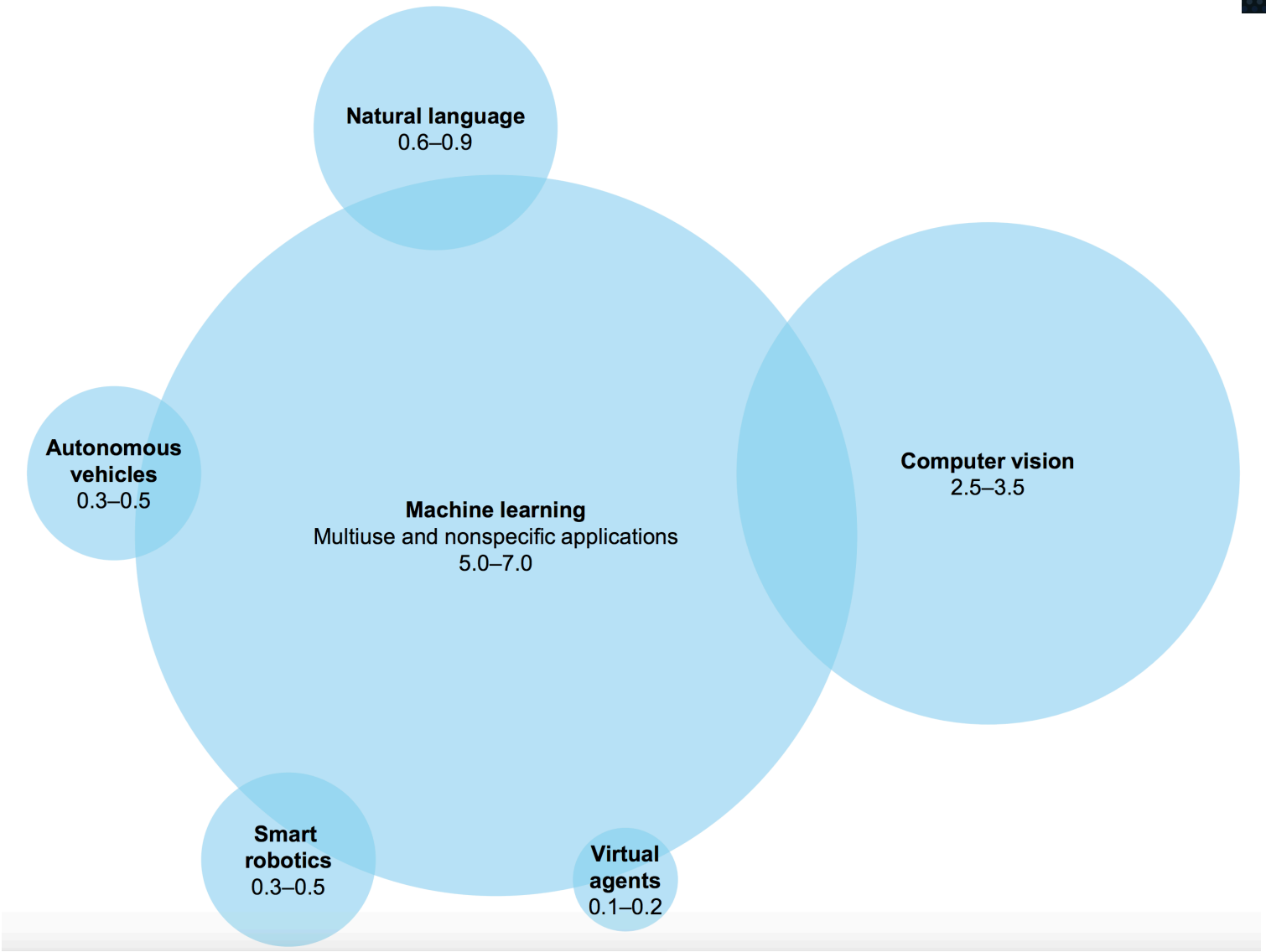
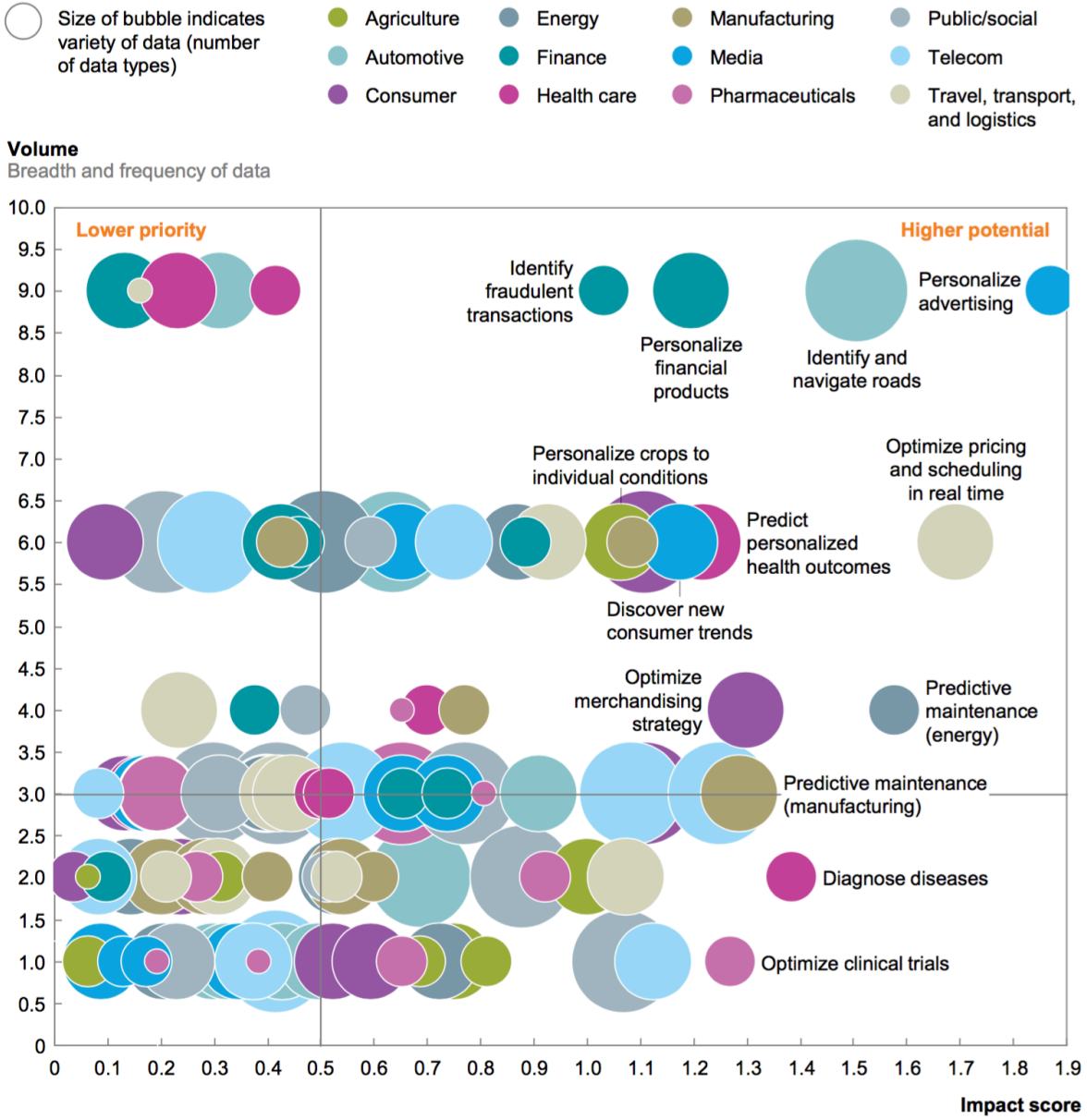
External investment in AI-focused companies by technology category, 2016[1]
$ billion



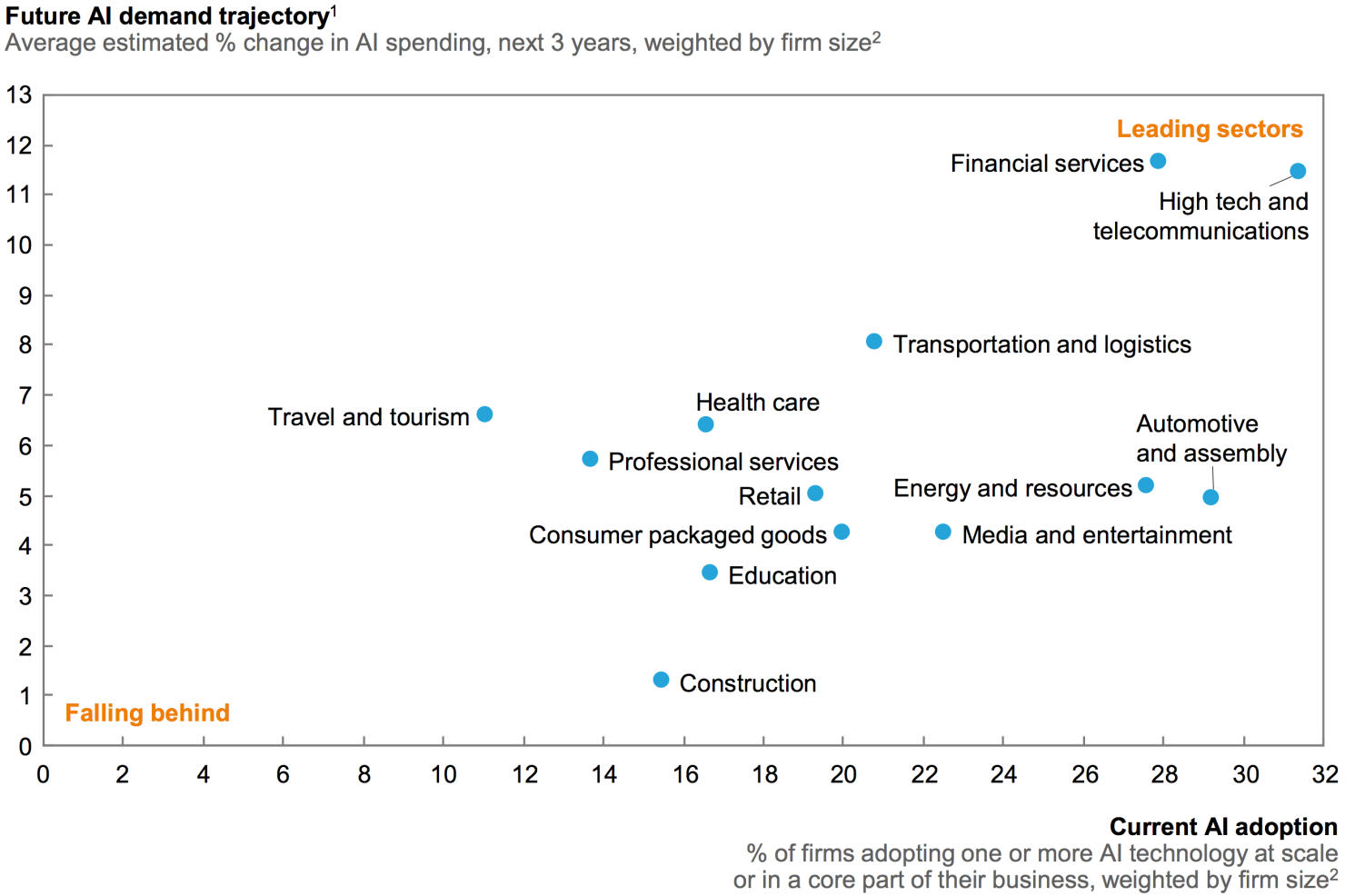
McKinsey Global Institute: AI the next Digital frontier 2017; https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/how-artificial-intelligence-can-deliver-real-value-to-companies

Machine learning has broad potential across industries and use cases



SOURCE: McKinsey Global Institute analysis

Sectors leading in AI adoption today also intend to grow their investment the most



1 Based on the midpoint of the range selected by the survey respondent.
2 Results are weighted by firm size. See Appendix B for an explanation of the weighting methodology.

SOURCE: McKinsey Global Institute AI adoption and use survey; McKinsey Global Institute analysis

McKinsey Global Institute: AI the next Digital frontier 2017; https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/how-artificial-intelligence-can-deliver-real-value-to-companies

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chiefmartec.com Marketing Technology Landscape

January 2015

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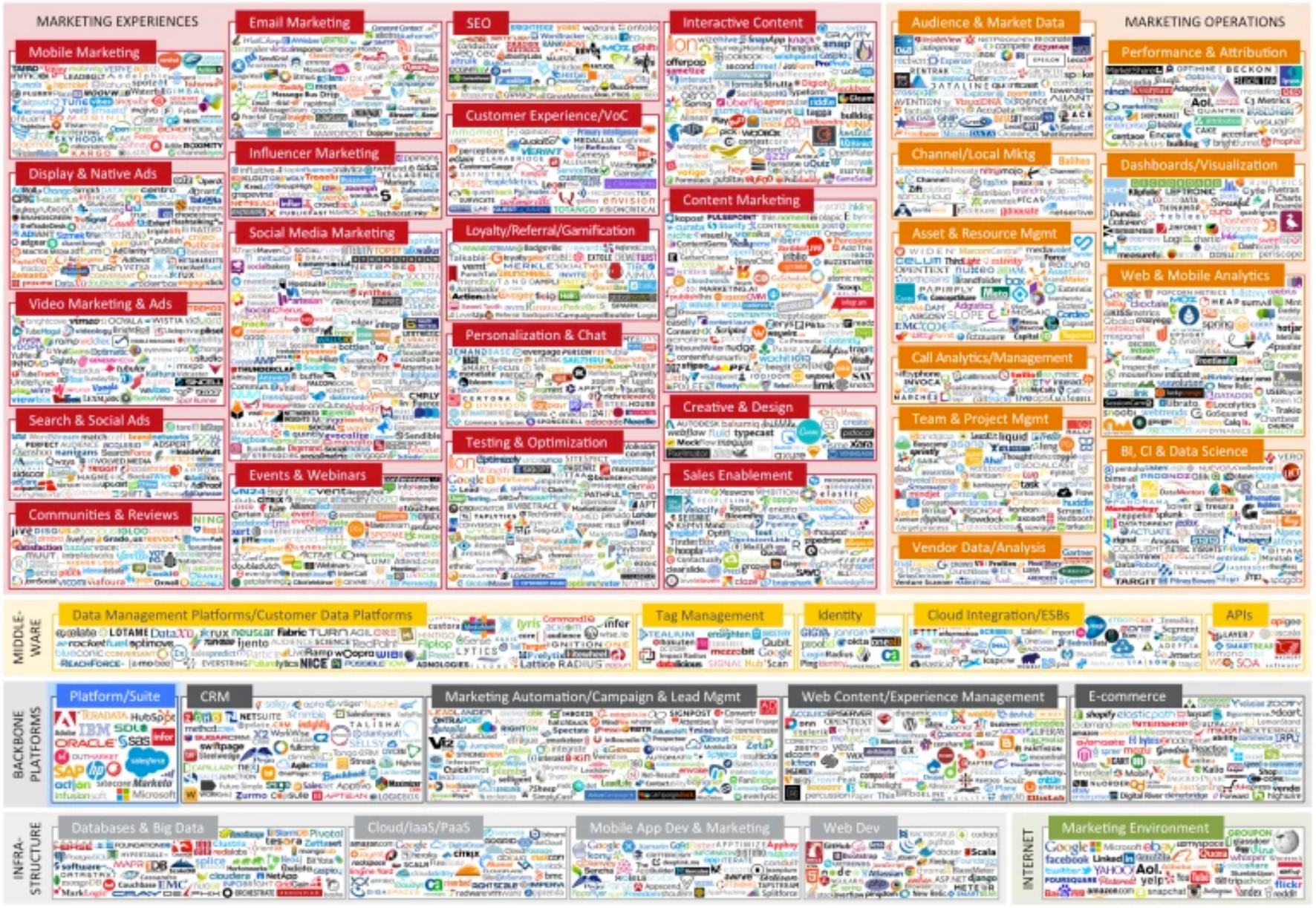
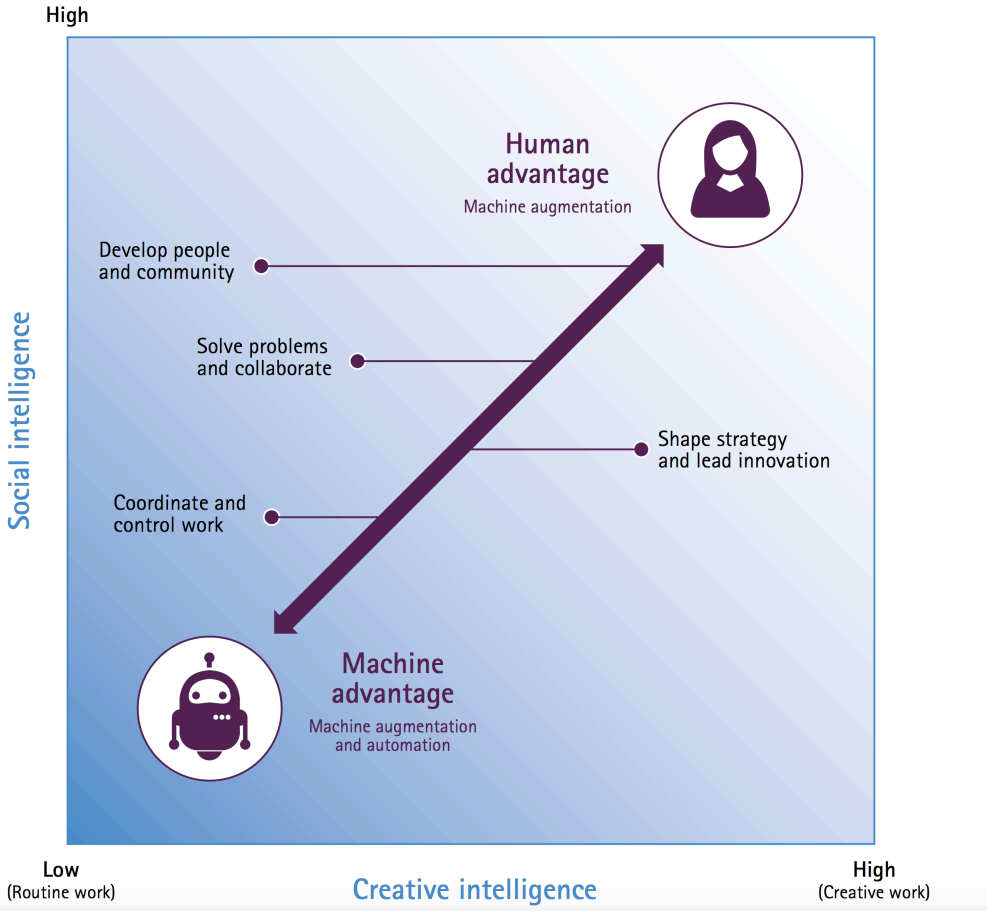


by Scott Brinker @chiefmartec http://chiefmartec.com

https://venturebeat.com/2015/06/01/the-guy-who-made-this-insane-2000-company-marketing-landscape-chart-is-sorry/

NLP vs Human processing



https://www.accenture.com/t20160928T230416__w__/us-en/_acnmedia/PDF-32/AI_in_Management_Report.pdf

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Where do I focus?

https://www.techemergence.com/machine-learning-marketing/

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AI in Marketing

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Pre-AI

- Search
  - Keyword
- Recommendation Engines
  - Collaborative filtering, Content-based filtering
- Advertising
  - News paper, TV, Online
- Marketing Forecasting
  - Research
- Speech / Text Recognition
  - ??

AI enabled

- Search
  - Auto spell correction, non-key words, image search, audio search
- Recommendation Engines
  - Deep Learning based on multiple-inputs
- Programmatic Advertising
  - automated buying and selling
- Marketing Forecasting
  - ML, Streaming data, Satellite Images, tweets, emails, Social media, IoT,
- Speech / Text Recognition
  - ChatBots, AudioBots, NLP, Sentiment analyses,

https://www.techemergence.com/artificial-intelligence-in-marketing-and-advertising-5-examples-of-real-traction/

Communications & Conversational Marketing

- Email management
- Email Sorting
- Insight Surfacing
- Contact Data Extraction
- Intent Determination
- Sentiment Analysis

https://www.prime-journal.com/lets-talk-how-conversational-marketing-can-make-you-a-better-practitioner/

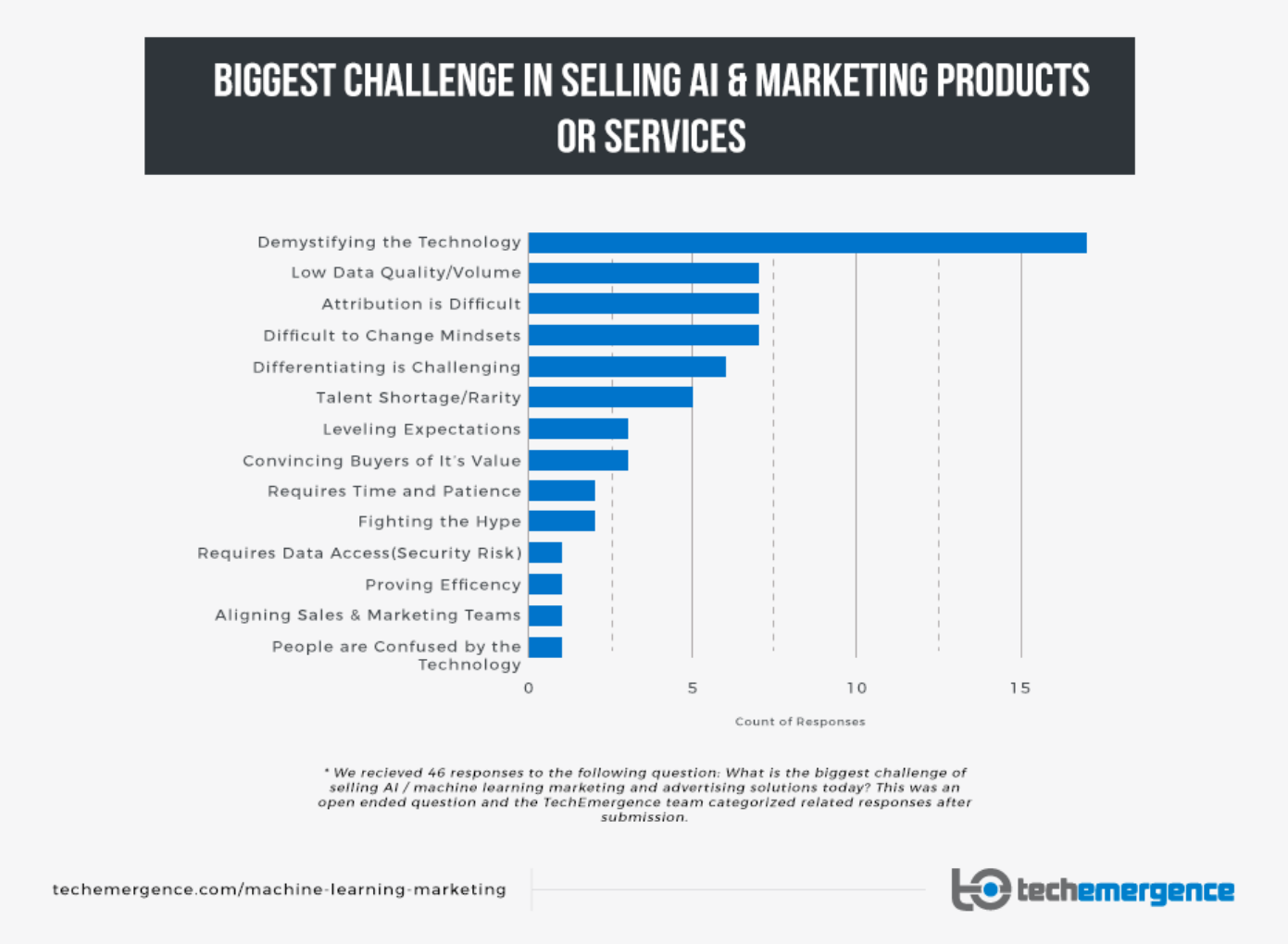
"The biggest difference between
companies who are poised to succeed in this new era of business and
those that aren't is

the ability to use software and other technologies to create new market opportunities"

– MIT Tech Review

https://www.technologyreview.com/s/608095/it-pays-to-be-smart/

Challenges



https://www.techemergence.com/machine-learning-marketing/

https://www.techemergence.com/artificial-intelligence-in-marketing-and-advertising-5-examples-of-real-traction/

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HOW ??

The unreasonable effectiveness of RNNs

RNN: 3 Layer RNN with 512 nodes per layer; 4.4 MB input file

PANDARUS:
Alas, I think he shall be come approached and the day When little srain would be attain'd into being never fed, And who is but a chain and subjects of his death, I should not sleep.
Second Senator:
They are away this miseries, produced upon my soul, Breaking and strongly should be buried, when I perish The earth and thoughts of many states.
DUKE VINCENTIO:
Well, your wit is in the care of side and that.
Second Lord:
They would be ruled after this chamber, and my fair nues begun out of the fact, to be conveyed, Whose noble souls I'll have the heart of the wars.
Clown:
Come, sir, I will make did behold your worship.
VIOLA:
I'll drink it.

http://karpathy.github.io/2015/05/21/rnn-effectiveness/

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Stanford CoreNLP

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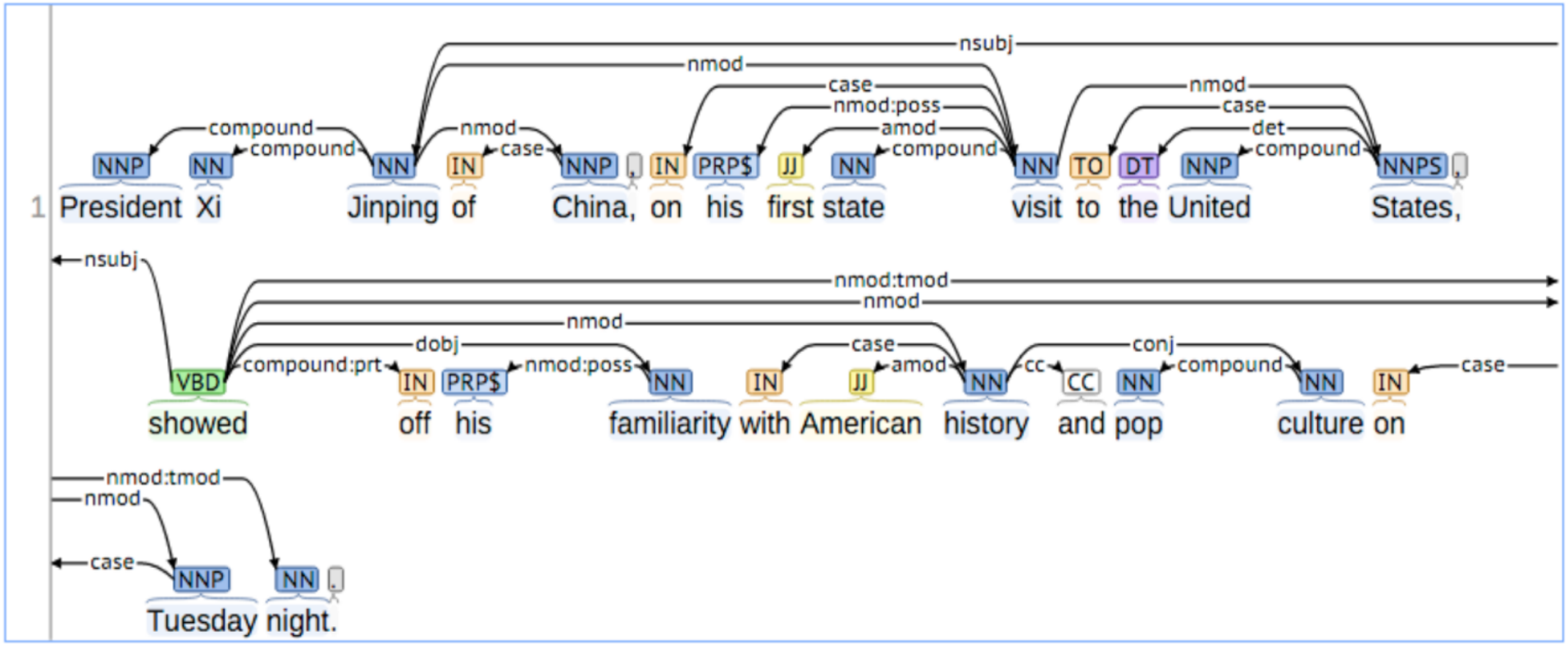
Basic Dependencies:



Ref: https://stanfordnlp.github.io/CoreNLP/

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Google Neural Machine Translation

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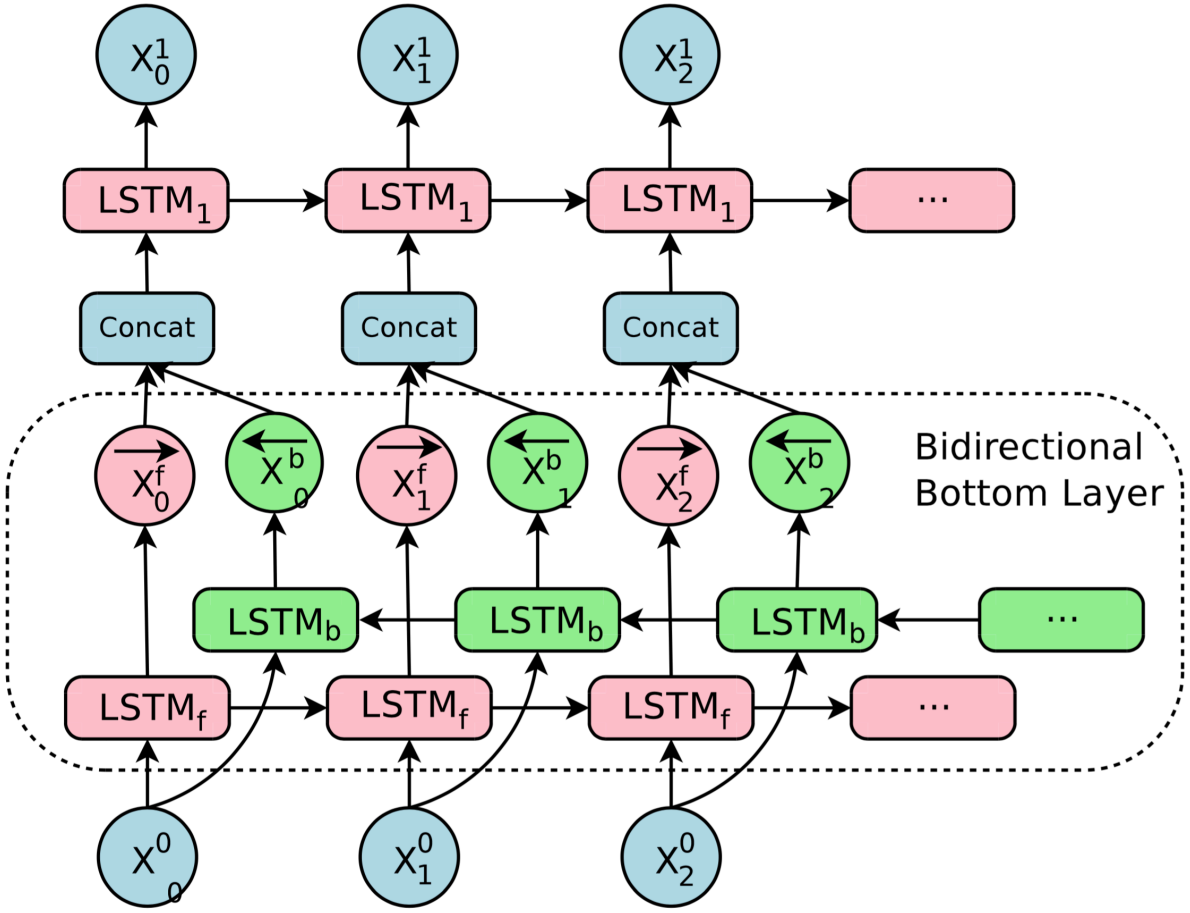

- 8 layer encoder and 8 layer decoder
- Bi-Directional encoder in layer1
- Residual connections
- Attention (from bottom to top)
- Low precision arithmetic during inference
- Beam search (Length normalization & coverage penalty)
- Rare words

Ref: Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation; https://arxiv.org/pdf/1609.08144.pdf

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Neural Model for summarization

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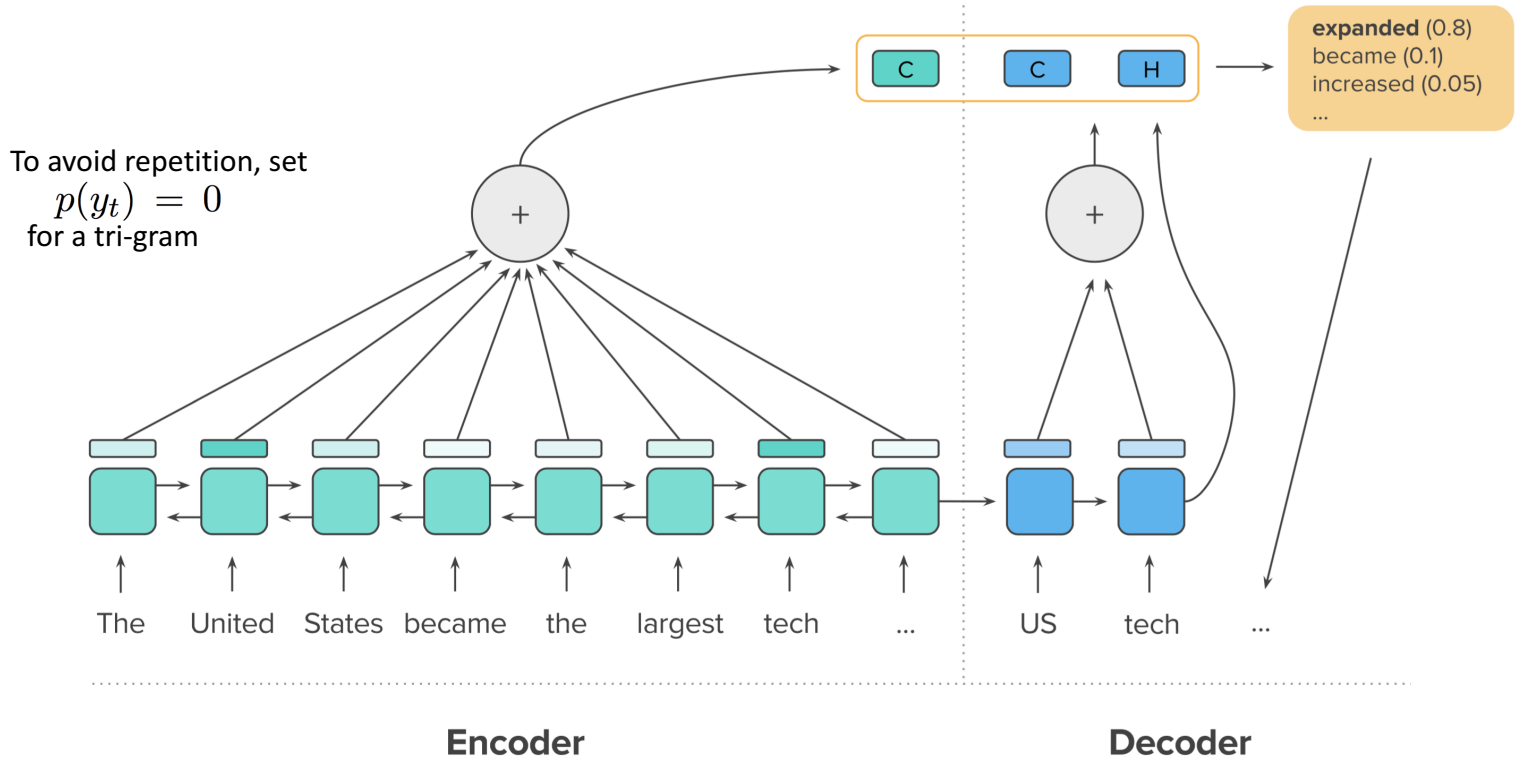

Figure 1: Illustration of the encoder and decoder attention functions combined. The two context vectors (marked "C") are computed from attending over the encoder hidden states and decoder hidden states. Using these two contexts and the current decoder hidden state ("H"), a new word is generated and added to the output sequence.

Ref: A Deep Reinforced Model for Abstractive Summarization; R Paulus, C Xiong, R Socher; https://arxiv.org/pdf/1705.04304.pdf

You can solve these too…

1. Predict which shoppers will become repeat buyers
2. Predict which ads contain illicit items or content
3. Predict which people are influential in a social network
4. Predict if a customer is satisfied or dissatisfied
5. Can you predict which recommended content each user will click?
6. Predict if context ads will earn a user's click
7. Identify individual users across their digital devices
8. Which customers will respond to a direct mail offer
9. Predict where a new user will book their first travel experience
10. Automatically spot duplicate ads
11. Predicting users' demographic characteristics based on their app usage, geolocation, and mobile device properties
12. Identify which customers have the most potential business value
13. How much interest will a new rental listing receive?
14. Customer churn prediction
15. Predict if a driver will file an insurance claim next year
16. Forecast future traffic to our website
17. Can you assign accurate description labels to images of apparel products?
18. Maximize sales and minimize returns of goods

https://www.kaggle.com


We installed a
low-range router,
to bring the whole
family together

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Thank you

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