



Your Career and Localization Strategy in the Age of AI

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About LILT



Founded in 2015 to productize AI research at the Stanford AI Lab



Advanced AI Platform + Solution that transforms global enterprise language processes



Contextual AI Engine language models that are self-learning.



Connector-forward platform that integrates language models into enterprise systems like Zendesk and Adobe Experience Manager.



Human Feedback guarantees quality and powers in-context learning.

There's never been a better time to be in the enterprise language field!

In 2023 AI for language is at the center of two major trends

1. **Tech:** AI systems and tools available *today* result in profound ROI for many globalization applications
2. **Macro:** After 15 years of “grow at all costs” businesses are focused on optimization
3. There is **so** much work to do: hiring / upskilling people, collecting data, transforming processes.

What this means for language professionals

- You can capitalize on the biggest technology shift in a generation
- You can show the ROI that every business leader is seeking

Business impact ⇒ career accomplishments ⇒ advancement

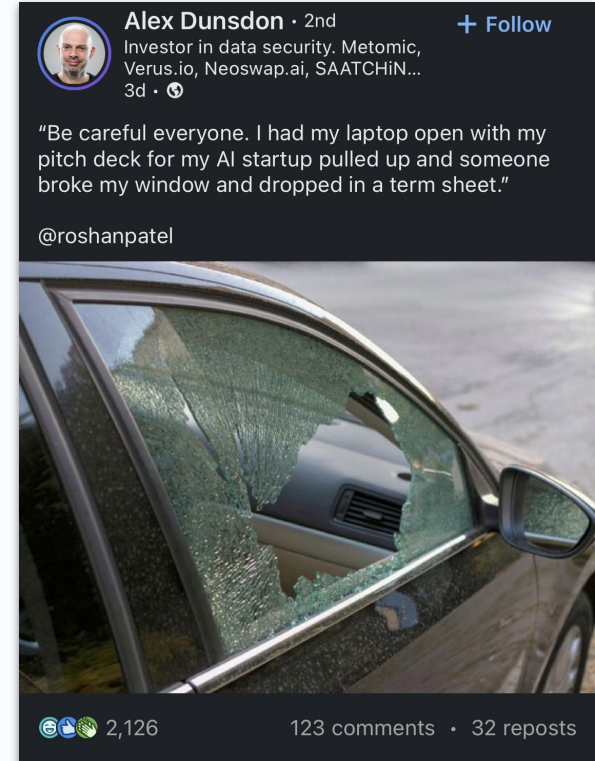
Today's Plan: Two Recent Customer Questions

Is “generative AI” another hype cycle (like big data, web3, metaverse)?

- There is a lot of near-term silly stuff
- BUT, the impact on the enterprise in particular will be huge; there will be a few massive companies

My leadership challenged me to reduce cost by 50% using AI (!?)

- We'll work an example for a \$12M / year PNL



Outcomes for Today

You can (more!) confidently articulate the business value of AI vs. the hype

You see opportunity in management AI requests and you have concepts to build a business case

NOTE: we will be using “toy examples”

- Science / engineering speak for “oversimplification”
- ***Every*** organization is more complicated than the one we describe.
- We use a simple example so that we can find general principles that can be applied to specific business situations

Is “Generative AI” another hype cycle?



NLP is hot! The pace of innovation is accelerating

1950-1969 – early machine translation with simple rule-based systems

Translation as lookup tables: *maison* ⇒ house

1970-1992 – hand-built, rule-based, knowledge intensive systems

Morphological modeling with finite state automata

Computational grammars such as LFG and HPSG

1993-2012 – rise of empiricism: statistical, data-oriented systems

Driven by the abundance of digital text on the internet

2013-today – neural networks achieve state of the art across all tasks

2018-2019: pretraining (i.e., BERT) and GPT-style models

Recent enthusiasm comes from a series of breakthroughs

Recent LLMs (GPT3/4, PaLM, etc.) represent a profound breakthrough in natural language understanding and human-machine interaction

If someone in the field told you they predicted this before ~2019 don't believe them!

Hype: More like nuclear energy, less like web3, crypto, metaverse, etc.

Generative AI systems made possible by three computing breakthroughs:

2012: Word embeddings + generative pretraining

2017: The Transformer

2019–2020: Scaling laws + emergent multitask learning

If you've been using machine translation anytime since about 2003 then you've been using Generative AI all along!

LLMs use digital neurons to operationalize reasoning

Many useful tasks can be designed as *sequence learning problems*

Translation Impossible n'est pas français \Rightarrow nothing is impossible

Code Generation Write Hello World in C. \Rightarrow `printf("Hello World!\n");`

QA What is the capital of the US? \Rightarrow Washington, DC

BIG IDEA: if a model can reliably predict the next word in a sequence, then it can effectively reason.

Unsupervised training on every sentence / document ever written!

"In the summer the weather is warm, and in the winter the weather is _____"

"Mary went to the _____"

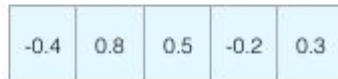
Breakthrough #1: *Generative pretraining* means computing vector-based semantic representations

Step 1: vectorize the object (words, people, etc.)

Step 2: compute the vector values from a large data set (“pretraining”)

Spence	
Openness	-0.4
Agreeableness	0.8
Conscientiousness	0.5
Negative emotionality	-0.2
Extraversion	0.3

1- We can represent things (and people) as vectors of numbers (Which is great for machines!)



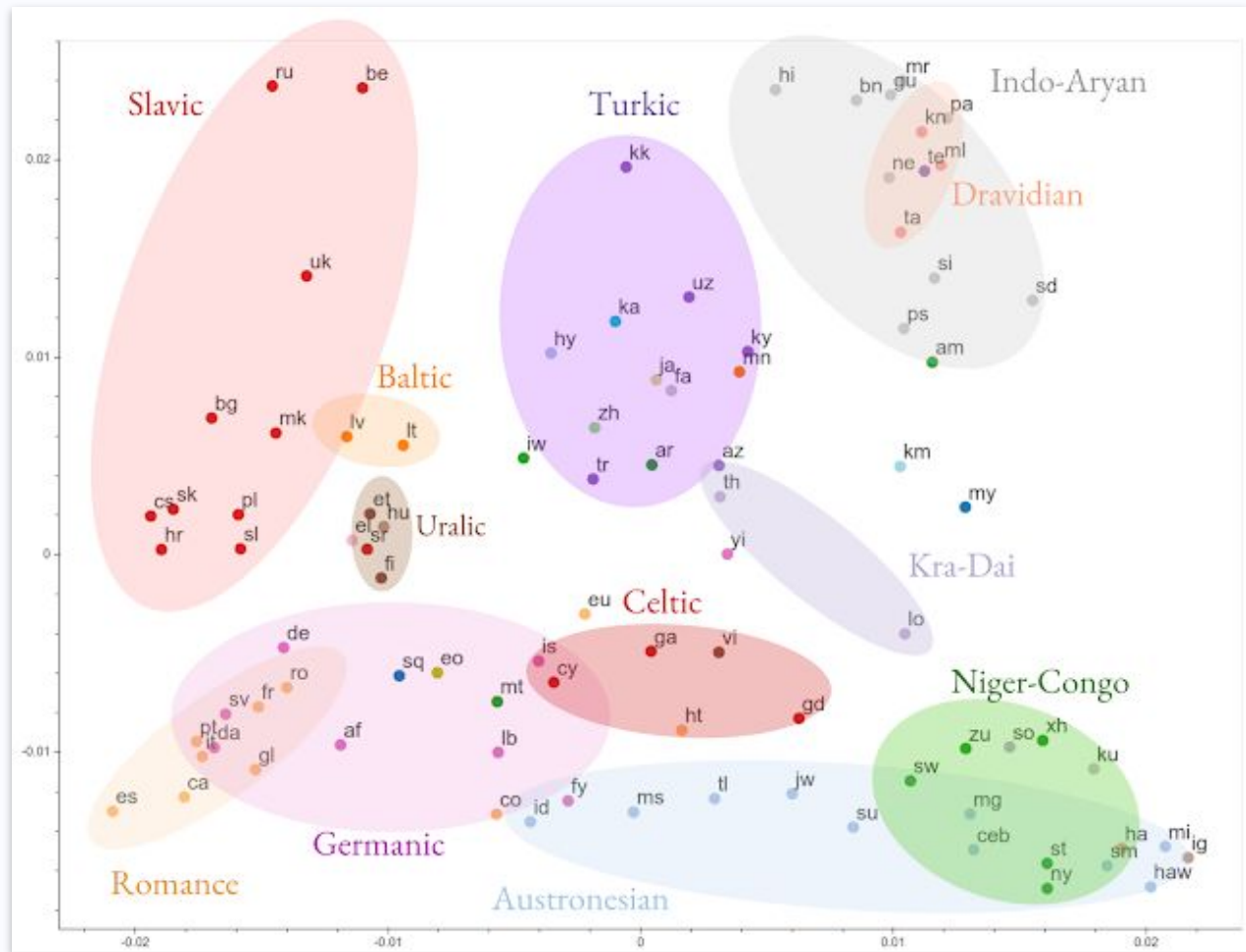
2- We can easily calculate how similar vectors are to each other

The people most similar

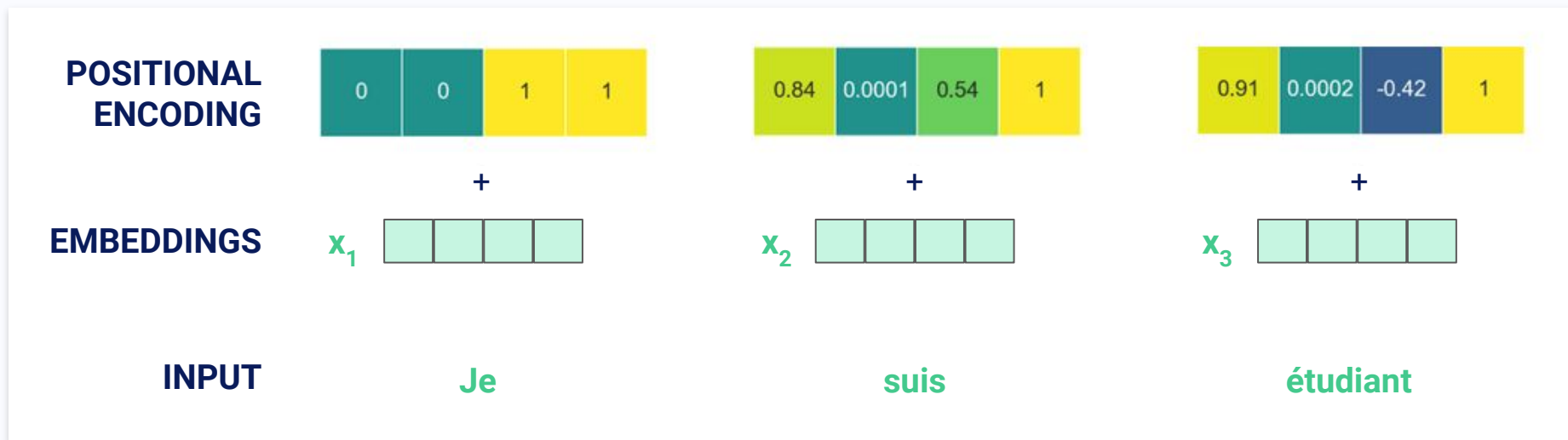
	cosine_similarity ▼
Person #1	0.86
Person #2	0.5
Person #3	-0.20

Surprising result:

Similarity of learned shared representations shows language typologies (i.e., language families)



Each input word is represented by a vector which is the sum of its position and contextual embedding



Strong linguistic motivation: operationalizes *distributional semantics*, or defining words by their linguistic context.

Breakthrough #2: *The Transformer* is a neural model that excels at modeling long-distance context in sequences

The animal didn't cross the street because it was too tired

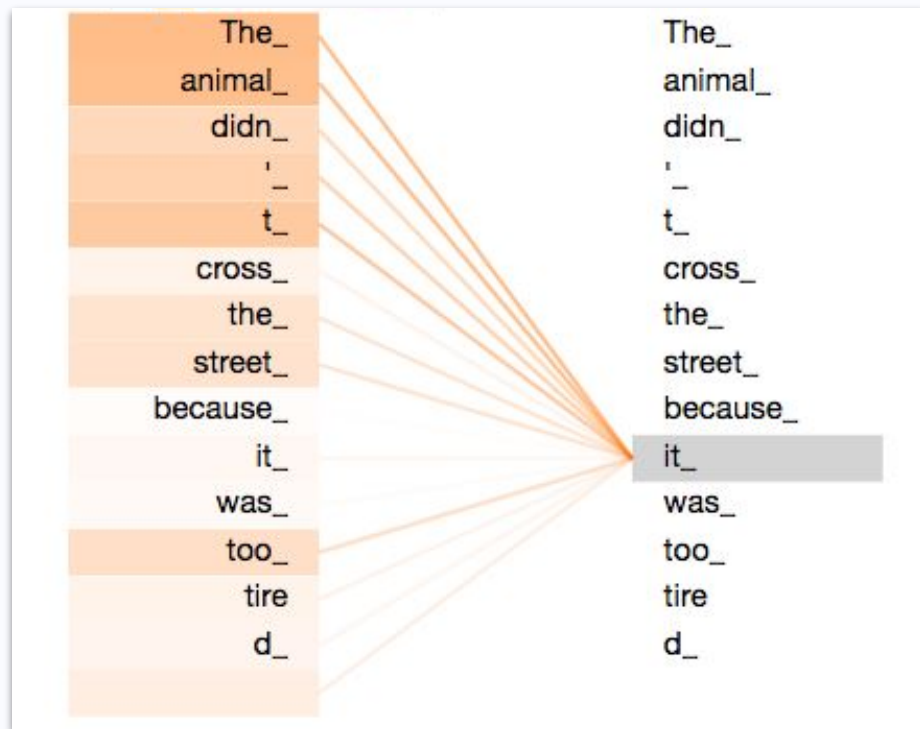
Trend is increasing context size

Training is VERY expensive

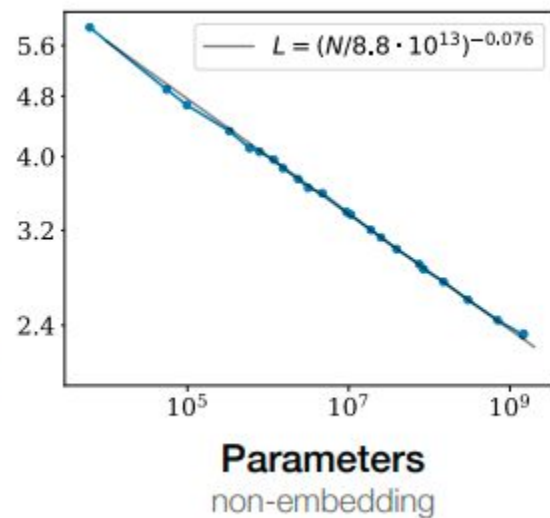
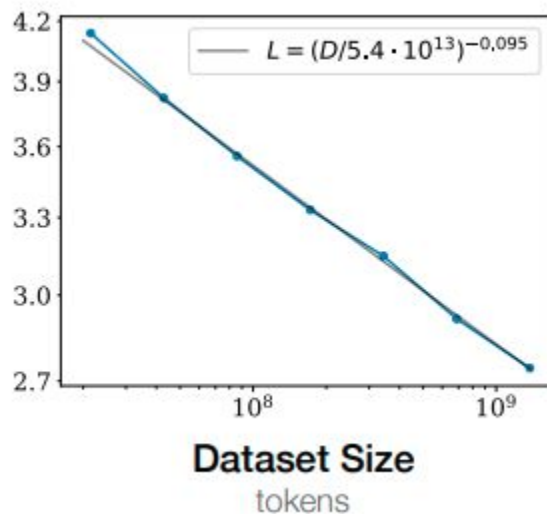
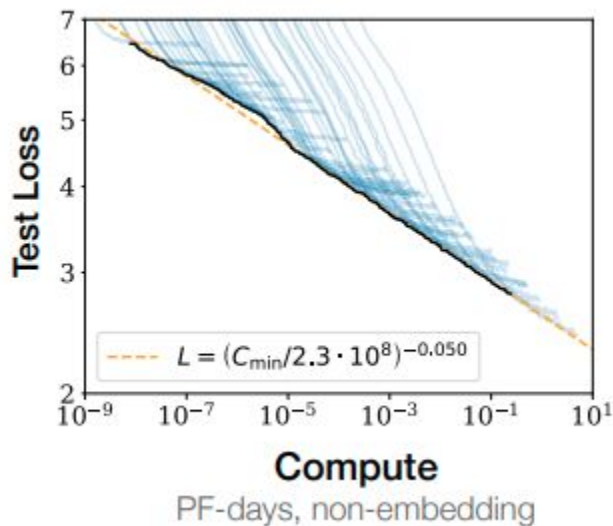
GPT4: 32k word context window!

Inference is ALSO computationally expensive

Can't use CPUs for many apps!



Breakthrough #3: Transformers get more accurate as compute + data + parameters scale up



[Kaplan et al. 2020]

Pretraining + Transformer + Scaling: Gives rise to *In-context Learning*, which appears to be a form of reasoning

Scientific: emergent phenomena

LLMs not built explicitly to do in-context learning

Train (predict next word) \Rightarrow do many applications

Practical / industry: complete change in how we build ML systems

Rapid prototyping of new ML ideas

Few examples needed to do useful things



Write a paragraph about something no one has ever written about in a style of someone who has never existed before.



In the vast expanse of untapped knowledge, there exists a fleeting concept known as the **Enigmatic Quasifluff** - a creation so elusive, not even the bounds of my digital mind can fully grasp its essence. As an AI language model, I've encountered countless ideas, yet the Quasifluff remains a captivating enigma, constantly slipping through the synapses of my neural nets. Its nature, seemingly woven from the threads of uncharted territories, is an embodiment of the infinite potential that lies within the unknown. This

Large LMs have a (surprisingly) wide variety of applications via In-Context Learning

NLP Task	Example	Applications
Text generation	Generate a blog post given a prompt	Content marketing, support articles
Question answering	Generate an answer given a natural language question	Enterprise search, knowledge management
Language translation	Generate a French sentence given an English sentence	Translation and multilingual quality control
Code correction and generation	Find bugs, generate code from text descriptions	Software development and QA

What these breakthroughs mean for the enterprise

Broad learning: LLMs are a general purpose, machine-based language capability

Narrow tuning: LLMs can be specialized to many applications via meta learning

- Key to getting this working: in-domain data.
- Language teams have lots of this: translation memory, glossaries, monolingual data, styleguides

Has AI changed your life? Not yet, but broad business / consumer apps coming:

Natural language interfaces to silicon

A digital assistant / companion for everyone

Enterprise BI / synthesis based on natural language queries (no SQL!)

How can I transform my program with AI?

Case Study

AttentionCorp is a large, multinational industrials company with many different product lines

It has a centralized language function that is an enterprise shared service

Annual budget (PNL) is \$12M / year, and has increased about 3% / year for the past 10 years.

Recently, management read an OpenAI report* showing that translation has the highest exposure to LLMs. They tasked Anita Flores, the department leader, with reducing spend by 50% using AI. Anita has three weeks to develop a plan to brief senior management.

Group	Occupations with highest exposure	% Exposure
Human α	Interpreters and Translators	76.5
	Survey Researchers	75.0
	Poets, Lyricists and Creative Writers	68.8
	Animal Scientists	66.7
	Public Relations Specialists	66.7

* OpenAI. 2023. "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models"

There are three types of business cases

Revenues - costs = profit

#1: Grow revenue

#2: Reduce cost

#3: Minimize risk

Current AI technologies mimic human capabilities.

Therefore, #2 is the most common form of business case.

A business case has four components

Component	Description
Opportunity and outcomes	What is the opportunity for the business? (Growth / cost / risk)
Strategy	Why now and how will we capture that opportunity?
Plan	What are the people / process / tools that we need to execute our strategy?
Budget and timeline	Which resources do we need?



Primary outcome

Optimize cost
(Increase agility if possible)

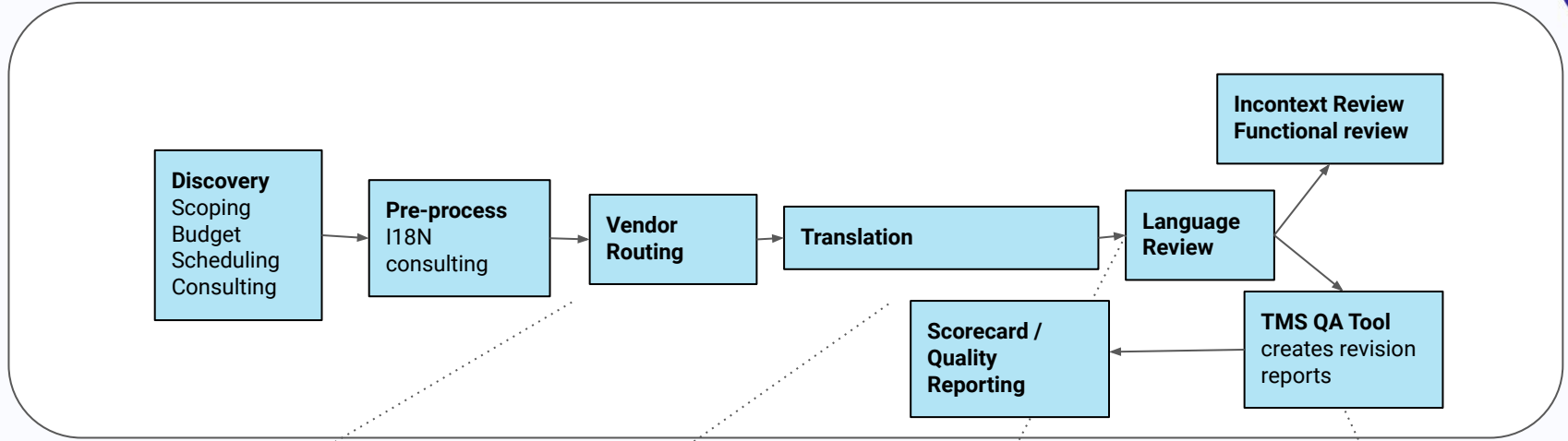


Secondary outcome

Increase reach by reinvesting
recovered cost

Today State: Current Production Workflow

Process



Challenges

- Data integration
- PM sorting not scalable and requires time and labor
- Potential for human error

- AA deployable for portion of content types; the rest manually assigned
- Work allocation triggered upon job creation, generating inherent lag time

- Review is fully manual, not standards-based

- Feedback loop lacks segment level feedback, limiting ability for translators to learn from mistakes
- Recurring manual TM alignment a quality risk and cost impact

Concept: Define the unit economics of the department

	Units	Unit Price	Total	% of PNL
Translation (words)	60000000	\$0.17	\$10,200,000	87.92%
Review (10% words translated)	6000000	\$0.06	\$340,000	2.93%
Functional Testing (releases @ 30hours)	12	\$3,000	\$36,000	0.31%
Anita	1	\$200,000	\$200,000	1.72%
Vendor Manager	3	\$120,000	\$360,000	3.10%
Loc / Systems Engineer	1	\$150,000	\$150,000	1.29%
Training, prof dev, other	1	\$100,000	\$100,000	0.86%
Translation Management System	1	\$150,000	\$150,000	1.29%
Support and maintenance (10%)	1	\$15,000	\$15,000	0.13%
Other software	1	\$50,000	\$50,000	0.43%
			\$11,601,000	100.00%

Unit Economics	
Total Spend	\$11,601,000
Goal Spend	\$5,800,500
Cost / word	\$0.17
Cost / word, Fully Loaded	\$0.19
Overhead	\$0.02
Goal Cost / Word, Fully Loaded	\$0.10

Requirements for AI / automation workflow changes

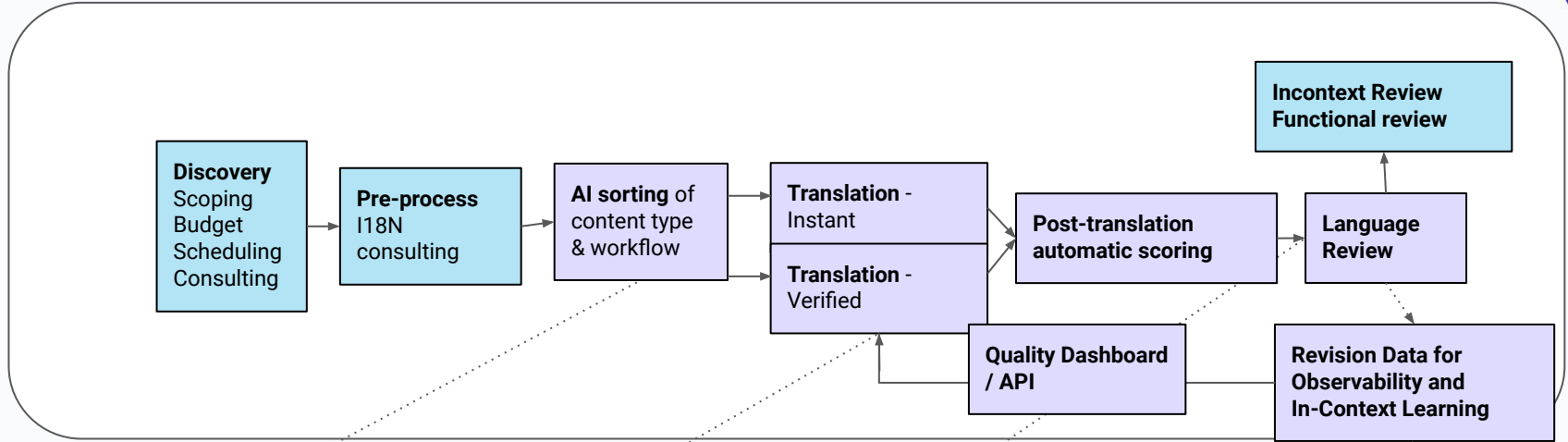
Requirement	Requires
In-context learning	AI platform with end-to-end vendor integration
Instant translation workflow	Data from verified workflow
Review automation	LLM access to review data
Automatic vendor / job routing	Single vendor OR automatic vendor selection
MQM-based quality scoring	MQM templates

Verified translation -- includes human review and guarantee.

Instant translation -- no human review.

Future State: Process optimization opportunities

Process



Automatic Job Routing

Add in-context learning to verified workflow

Install AI-enabled Instant Workflow

Post MQM-based post-translation scoring

Feedback loop exists in platform with segment level feedback for learning

Data / model updates

Implementation of Business Intelligence (for observability)

Optimization

Present three options and make a recommendation

Option #1 – Reduce Languages	
Goal Spend	\$5,800,500
# languages	20
# words / language	3,000,000
Cost / word, Fully Loaded	\$0.19
# reduced languages	10
Total Spend	\$5,800,500

On-goal, no change to operations

Option #2 – AI optimize translation + review	
Goal Spend	\$5,800,500
Cost / word	\$0.17
Review cost / word	\$0.06
Goal cost / word	0.08
Goal review cost / word	0.025
Total Spend	\$6,011,000

On-goal, same reach

Recommended	
Option #3 – Optimize translation + review + grow	
Goal Spend	\$5,800,500
Goal cost / word	0.08
Goal review cost / word	0.025
# languages	25
# words / language	3,000,000
Total Spend	\$7,248,500

Magic! 30% cost reduction, increase reach by 25%

Organize business activities using the PPT Framework

PEOPLE

- Upskill 1 person to be data owner
- Retrain vendor managers for AI / NLP 101

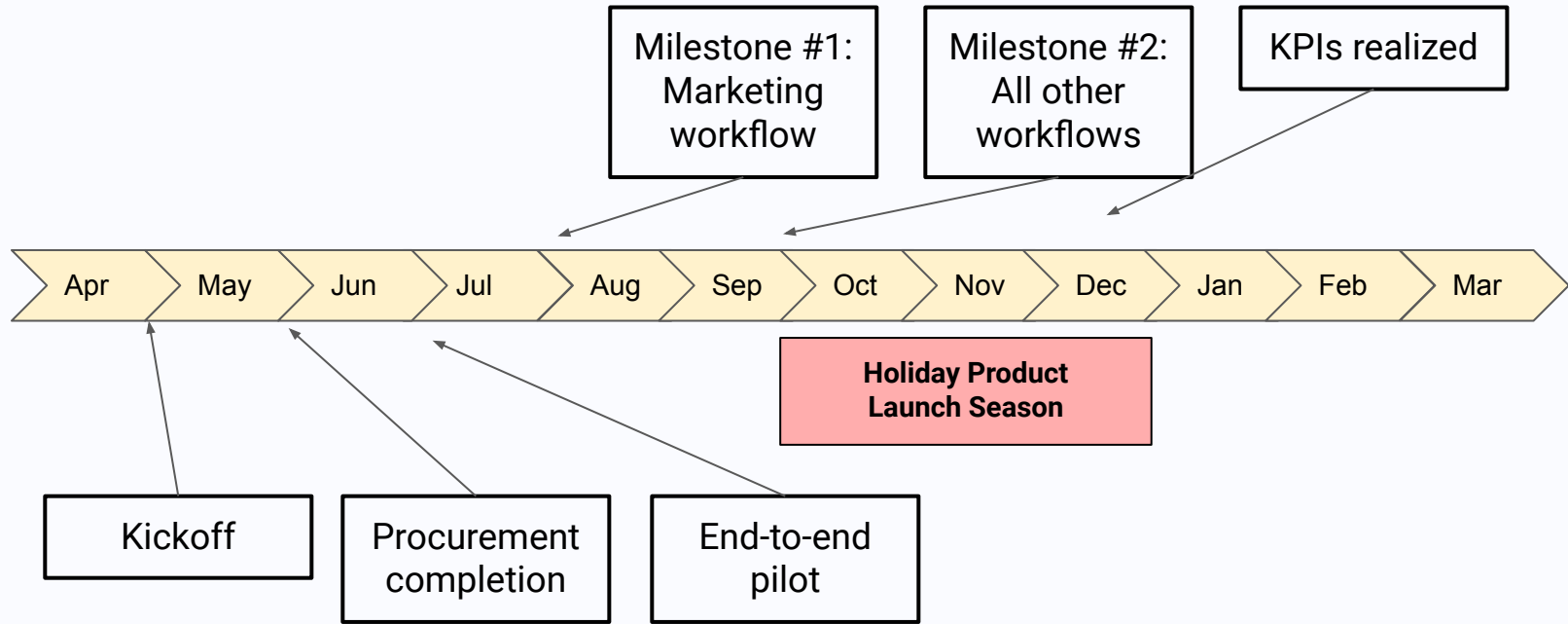
PROCESS

- Collect / organize / filter historical linguistic data
- Implement recurring data maintenance
- Define success metrics
- Define MQM templates per workflow type

TOOLS

- Implement AI Platform
- Implement metrics dashboards in BI tool

Anita's Implementation Timeline



Recap of Outcomes for Today

You can (more!) confidently articulate the business value of AI vs. the hype

⇒ Lots of noise AND real business ROI to be achieved now

You see opportunity in management AI requests and you have concepts to build a business case

⇒ Showing business ROI / Impact leads to recognition and career growth

⇒ NEXT TIME: setup risks / trade-offs with the recommendations.

If this has been helpful....

- Comment / follow on LinkedIn
- Send me an email at spence@lilt.com.
- More sessions to follow



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