

# LLM-POWERED CUSTOMER SUPPORT FOR LINEAGE

Final presentation for A-Lab 2024

Aziz, Darek, Ronan, Sabal





# LINEAGE – WORLD'S LARGEST LOGISTICS AND WAREHOUSING OF FROZEN GOODS COMPANY

Logistics and warehousing...

...of frozen goods





# PROJECT OBJECTIVE: AUTOMATE CUSTOMER SERVICE REQUESTS

**Now:** email handling is a highly manual and mostly repetitive task

Simplified process flow example for goods release Time consuming tasks Read and understand the email Request order release Read and reply to email If not, ask for clarification If so, instruct the team to release Schedule pick up Approve order Check if all order data correct

Future: most of incoming emails are automated, without the need for human interaction

# VALUE AT STAKE

Based on Lineage's CSR budget and time allocation to customer email management

#### Almost



invested annually in CSRs email handling

# WE CREATED MORE PRECISE SUBCATEGORIES FOR ORDERS AND APPOINTMENTS

**Old categories** 

Orders

Appointments

Reporting

Other

Inventory

Billing

Planning

# WE CREATED MORE PRECISE SUBCATEGORIES FOR ORDERS AND APPOINTMENTS

Order subcategories		Old categories	Appointment subcategories
Inbound		- Orders	New
Outbound		Appointments —	Rescheduled
Onsite		Reporting	Cancel
		Other	
		Inventory	
Other category		Billing	
		Planning	

# BERT IS THE BEST CATEGORIZING MODEL AMONG FOUR ALTERNATIVES

### Models' performance indicators



<b>Dimension \ Method</b>	Bag of words	TF-IDF	BERT	Llama 3.1
Precision <sup>1</sup>	46%	74%	90%	93%
Speed (time per 1000 emails)	45 sec	<1 sec	10 sec	5400 sec
Consistency				
Scalability				
Interpretability				

<sup>1.</sup> Precision weighted by category size; BERT's precision for a model with a 94% threshold; Llama's precision expressed as truthfulness rate (= 1 - hallucination rate)

#### Receive email

### Classify email and extract info

3. Purchase Order or BIG of Lading Number:

BERT model classification

Ernall cathagory: Nava appoi

Ligamya 3. 1 indio extinaction

4. Carriar Information: null

\* Company: Client Logistics

& Driver Phone Number: null

\* Email: john.clant@clant.com

5. Contact Information: \* Name: John Client

\* Phone: 123-456-7690

Extracted information:

1. Date: 4/36

2. Tonac 1300

SECTES / SECTES

#### **Send response**

Thank you for your email. We appreciate you taking the time to

provide the necessary information to schedule a new

following details extracted from your message:

To ensure we have everything needed, please confirm the

3. Purchase Order or BIT of Lading Number: 96765 / 56769

5. Contact Information: John Client, Client Lightics,

necessary updates at your serliest convenience.

123-456-7690, john client@client.com

6. Driver Phone Number: Not provided

A. Carrier Information (SCAC, DOT, or PIC Infig. Not provided

If any information is missing or incorrect, kindly provide the

Thank you again for reaching out. We look forward to your

Dear John Client,

appointment.

1. Date: 4/36

J. Tonac 1300

Basel regards

The Lineage Team

Good morning,

Can we please schedule a pickup appointment for the following PO?

98765 / 56789 - 4/26 at 1300

Thank you,

John Client Client Logistics

123-456-7890 john.client@client.com<mailto:john.client@client.com>

This message contains confidential information and is intended only for the individual named. If you are not the named addressee you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete this e-mail from your system. E-mail transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this message, which arise as a result of e-mail transmission. If verification is required please request a hard-copy version.

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\* Phone: 123-456-7890

\* Name: John Clant

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**BERT model classification** 

Ligamya 3. 1 indio extinaction

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SECTES / SECTES

Email category: New appointment

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Email category: New appointment

#### Llama 3.1 info extraction

Extracted information:

1. Date: 4/26

2. Time: 1300

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98765 / 56789

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\* Name: John Client

\* Company: Client Logistics

\* Phone: 123-456-7890

\* Email: john.client@client.com

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Best regards, The Lineage Team