

Juan Manuel Ruiz



Manuel Herranz



Alanguage #LocWorld51 Dublin



Juan Manuel Ruiz García is chief technology officer at **Agencia EFE**, the world's premier Spanish-language news agency, leading the development of cutting-edge technical solutions tailored to empower its journalists and drive innovation across the entire organization. EFE's primary objective is to harness the power of technology to enhance its content contribution, production, and distribution systems, ensuring that it remains at the forefront of the rapidly evolving media landscape.



Manuel Herranz is the CEO and founder of **Pangeanic**, a company specializing in NLP and translation services. He holds degrees from Manchester University and Entrepreneurship from MIT. He has an industrial background (Ford, Rolls Royce, and B.I. Corporation of Japan) and believes in language automation.

Manuel is known for his expertise in NLP processes, pattern recognition, deep neural networks, and adaptive technologies, pioneering "self-training MT" (DIY!) in 2009. An advocate for Ethical AI, he also actively supports several NGOs, including initiatives for better access to female education in the African sub-Sahel.





# What is a news agency for?

- Gathers and verifies news: Collects and checks information from various sources to ensure accuracy and reliability.
- Writes and edits news stories: Creates and refines news articles, headlines, and summaries for publication.
- Distributes news to clients: Provides news content to rewspapers, magazines, online platforms, and other media outlets.
- Provides multimedia content: Offers photos, videos, and audio files to complement news stories.
- Monitors and updates news: Continuously tracks and updates news stories as new information becomes available.

... the more languages you manage, the best













# Agencia EFE

- Agencia EFE is the largest Spanish-language multimedia news agency. International, multiformat and multilingual
- 3M news items per year. Our content reaches daily to 2,000+ media publications
- 2,000 journalists from 60 nationalities, operating 24/7 from more than 1800 ities in 110 countries and with 3 editorial desks in 3 continents: Madrid, Bogotá and Bangkok.
- Idiomatic bureaus in Rio (Portuguese), Delhi (English), Cairo (Arabic) and Barcelona (Catalan).
- Website contains more tan 55,000 pages of news

We are pangeani.
Language Technology

- Pangeanic is renowned in the field of Language Technology, with a specialization in Machine Translation and Natural Language Processing (NLP). We have consistently evolved from our LSP origins to pioneer Al adoption in the language industry
- We look at MT as a Machine Learning Data Science challenge
- Mission: To create efficient solutions that optimize the value and processing of language data with an emphasis on privacy





Other NLP: Annotation, Data classification, Anonymization, automated subtitling, speech, data-for-Al, Al chatbot systems

Language Is No Longer Human: RAG LLMs at News Agency EFE "World" Collective Knowledge Intelligence Language Al Disciplines (immediacy) · deep learning · image recognition Machine Learning (ML) supervised Vision · machine vision ·unsupervised Reinforcement Learning + HF **Expert Systems DPO** LLMs · named-entity recognition · speech to text · hate speech detection Speech · text to speech · bias detection Artificial Intelligence · auto domain classification · classification **Robotics Natural Language** · machine translation Processing (NLP) · Q&A / Chatbot **Planning** · NLU / NLG

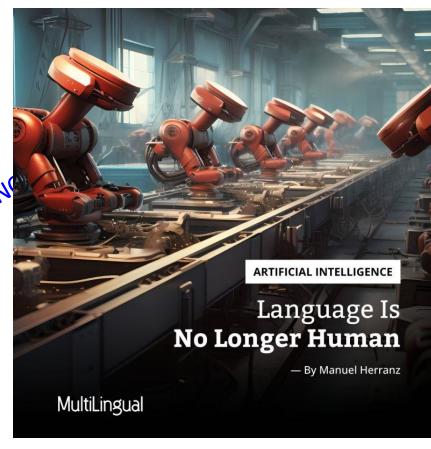
Stop thinking about "language industry" and really adopt industrial, manufacturing processes.

Translation is one clear domain in which AI is excelling beyond human capabilities. [..] not easy to control LLMs' generation capabilities so that they become "true and faithful translators," [...] accuracy and terminology control can be resolved by [...] Retrieval augmented generation [...] very promising role

"AI already cracked the code of human language, no wonder language could become a commodity."

Al represents both a challenge and an opportunity for humans, fundamentally altering how we live, work, and learn. [...] imperative to strike a balance between harnessing Al's potential and safeguarding human dignity by avoiding job displacement and promoting responsible innovation — which is why I'm so vehemently against the "fair use" of copyrighted material to train models.

What truly makes us human is not language. It is the ability to respond to the unexpected. Call it "reasoning" if you wish.







# **EFE** in (Automatic) Translation

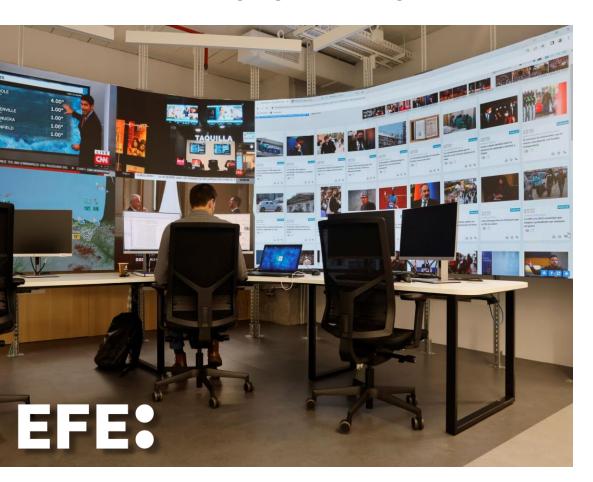
**early 2000**: first automatic translator (Automatic Trans)

**2010**: Ta With You

2018: Ed. System connection (WS)

2019: Tender for Saas + API

2021: New Tender: PANGEANIC



# How it all began...

Tender for Machine Translation in 2021.

General translation engines with a "journalism flavour" for internal use and web publishing.

Full API Management for integration in journalists' processes.

Journalists reviews / "post-edit". Often divert from source to add specific or "personal" touch [localize].

- Workflow 2021-2023... (2023 is "traditional"!!)
- Baseline > Customization > Re-training

L	私はパリをよく知りたい人にお勧めします。	I would recommend it to anyone who wants to know Paris well.
L	この年の天気は暑いです。	The weather is hot at this time of the year.
	私はその場所には一度も行きません。	I would never go back to that place.
	東京・築地市場 (中央区) の豊洲市場 (江東区) への移転問題を調査する都議会の百条委員会は20日、豊洲地区	The 100-year committee of the metropolitan government investigating the relocation
	石原氏は「(都庁組織の)ピラミッドの頂点にいる人間として、(豊洲移転を)裁可したのは私の責任」と述べ、都	Mr Ishihara said It is my responsibility to sanction (the Toyosu relocation) as a pers
	東京ガスに追加の土壌汚染対策費用を負担させないとする「瑕疵担保責任の免除」が、2011年3月の土地売買	Regarding the circumstances in which exemption from liability for warranty against
	おせち料理に欠かせない「かずのこ 」。	Kazunoko (herring roe) is indispensable in new year dishes.
	別の鍋で昆布だしをとり 、醤油、みりん、日本酒を加えます。	In another pot, boil water with dry kelp, before adding light soy sauce, mirin and sake.
Г	春になると回遊してくる何百匹もの ニシンは 水中 で黒 い塊となってうごめき、水面に飛び跳ねるとその音が響き渡ったもので	In spring, the herring came with a roar as millions flipped at the surface and turned the wate
Г	ホシズナは生きているときは海藻などに付着して生活しているため、飼育にはそのような"生息場所"の提供が欠かせない。	When alive, star sands live by attaching themselves to things like kelp, so a similar living en
Г	ゲームニシンのサラダ。	Game Salad with Salt Herring.
	その後、漁業と は無関係の複雑な生物学的理由により、 北海のニシンは数が減っ ているのです。	Since then, for complex biological reasons that have nothing todo with fishing, the number c
	当社は、「日本をオリジンとしアジアを代表するグローバルプレイヤー」の実現に向け、世界中の市場で成 長性を高めることを	In order to become a "Global Player Representing Asia with itsorigins in Japan", Shiseido ha
	その昔、夏 は船で新鮮な魚がヘルシンキま で運ばれてきましたが、冬になる と海が凍り、魚を船で運ぶことが できなくなりま	Long ago, fresh fish was carried to Helsinki on a ship in summer, but the winter ice arrived,
	企業価値の最大化を経営の最重要課題のひとつとして位置づけ、擬似カンパニー制や F C F (フリーキャッシュ フロー)、 D V	The Company considers the maximization of corporate value to be the most important manadalkincojp
	ニシンのような海底産卵性の魚種は特にこの影響に対して脆弱である。	Species of fish with demersal eggs, such as herring, are particularly vulnerable to this impact





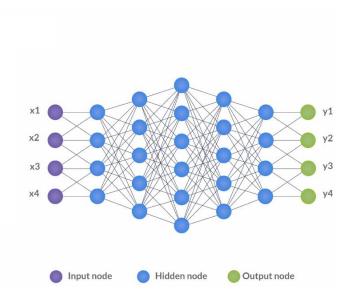
## NMT neural network

Although NMT is a single neural network,, we can think of it as

An Encoder

&

A Decoder

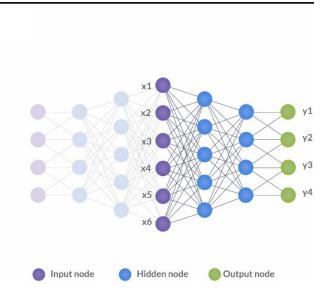




### NMT decoder

The optimized model becomes the input of the decoder.

The decoder uses the optimized model [from the source sentence] to predict the optimal target-language version.





# Easy to understand

Pangeanic produces RAG-based Adaptive GenAl for Al Chatbots and next-generation machine translation processes. PT: A Pangeanic produz GenAl adaptativa baseada em sistemas RAG para chatbots de IA e processos de tradução automática de última geração.

JA: Pangeanicは、AIチャットボットや次世代機械翻訳プロセス用のRAGシステムをベースとした適応型GenAIを製造しています。

FR: Pangeanic produit une GenAI adaptative basée sur des systèmes RAG pour les chatbots d'IA et les processus de traduction automatique de nouvelle génération.

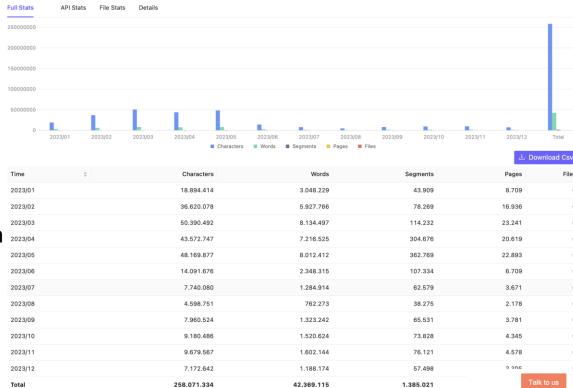
ES: Pangeanic produce GenAl adaptativa basada en sistemas RAG para chatbots con IA y procesos de traducción automática de próxima generación.

**NMT** 



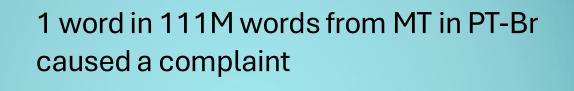
### 2023/24

- 42,3M words machine translated in 2023
- Over 111M words since 07.2021
- Mostly web articles, internal articles for EFE's internal team of journalists
- Little NMT customization





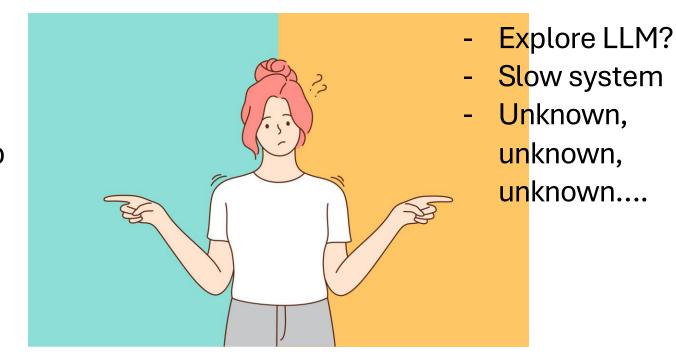
Journalists' preferences led to further customization in 2023



-->New Normal



- Search & clean?
- Retrain?
- Filter "stop words"





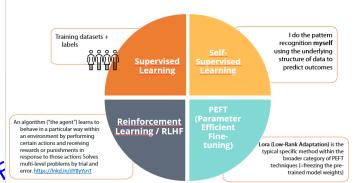
# Exploiting LLMs for what they weren't designed for 2023: Dolly, Vicuna, Llama 2 (Mixtral 8x78

2023: Dolly, Vicuna, Llama 2 (<u>Mixtral</u> 8x7B late '23)



- Creating a chatbot from structured data (RAG) -> Automated Post-Editing
- Entity Recognition (Anonymization/NER detection)
- MTQE Machine Translation Quality Estimation (MT)
- Live Text/Document Classifier
- ChatGPT for MT did not beat our own NMT client engines (+ privacy issues and cost)

### 4 ways to fine-tune (re-train) an LLM



LoRA = Train 6% for 98% cost reduction

### MTQE: Machine Translation Quality Estimation

In 13B, we find a

similar to ChatGPT: 0,3!!!

correlation

### **RESULTS**

### Llama13B

- Verbosity but higher accuracy than 7B
- In 7B, Pearson correlation coefficient not significantly differenthan 0

(0.07961028974964038)

### RESULTS

### Mixtral 8x7B

- Verbosity but higher accuracy than Llama 13B!!
- With minimum LoRA, Mixtral can "estimate" MTQE and rank in TER as good as ChatGPT 3.5
- Better than prompting: more segments processed, predictable output.
- Downstream usage

### **Unstructured Data Classification**

### **OBJECTIVE**

- Classify emails spam / no spam
- Llama2 7B & 13B / <u>Mixtral</u> vs naïve-bayes traditional method

### **METHODOLOGY**

- 1,000 tagged emails (20 untagged = test dataset)
- Create specific prompt
- Fine-tune model
- Evaluation KPIs vs naïve-bayes

### **RESULTS**

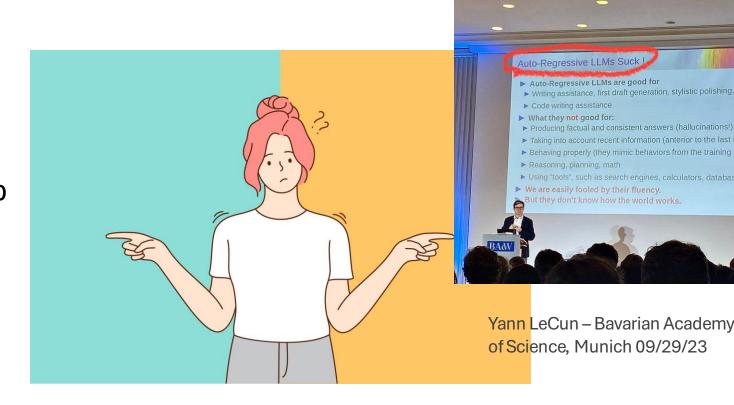
- Bayes: 33,76 mails/sec CPU Accuracy 0,76; Recall 0,61
- Llama 2 13B: Memory constraints, 1,45 mails/sec GPU Accuracy 0,75; Recall 0,82
- Mixtral Memory constraints, 1,5 mails/sec GPU Accuracy 0,79; Recall 0,84



https://pangeanic.com/use-cases/efe

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- Search & clean?
- Retrain?
- Filter "stop words"





# One LLM Project: Chatbot from structured data (RAG)

### **OBJECTIVE**

- In-domain Question
   Answering from technical user manuals.
- Evaluate different training methodologies (dataset size, epoch, full finetunigvs LoRA).

# off the shelf. Off the shelf. results

## **METHODOLOGY**

- Automotive documentation (full website)
- H1, H2 H3 =

  "How to" and R

  body is the answer
- Fine-tune model
- Evaluation KPIs

# RESULTS

Not useful
Response
appears helpful,

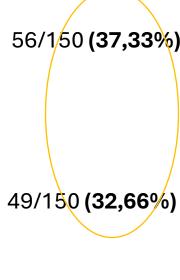
but additional text is repeated

Very useful, correct answer

No answer

12/150 **(8%)** 

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35/150 (23,33%)

One LLM Project: Chatbot from structured data (RAG) -> Automated Post-Editing

### **OBJECTIVE**

- **Search questions** become TMX
- Avoid certain expressions

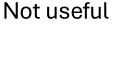
# Off the shelf · Lesults

### **METHODOLOGY**

- Prioritize human input vs LLM "knowledge"
- Fine-tune model O

  Prompting TERRO
- **Terminology**
- **Evaluation KPIs**

# RESULTS



Response very

helpful, very small editing

answer

Useful, correct

70% less

No answer

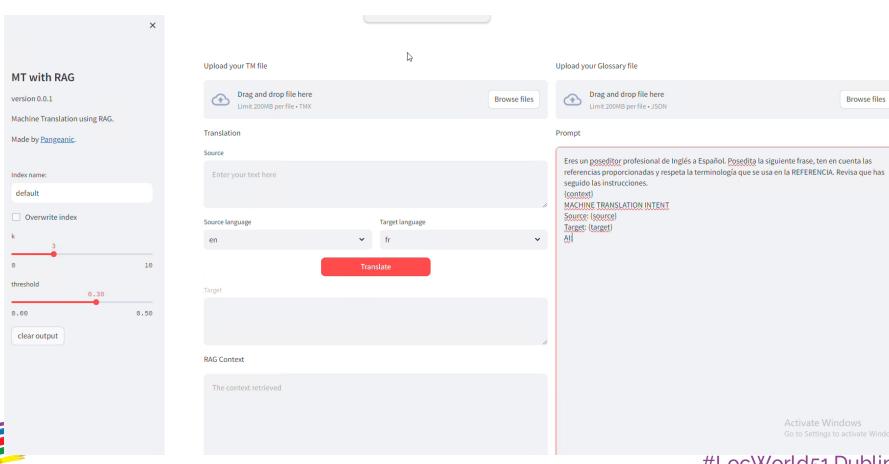
0/150 (0%)

35/150 **(23,33%)** 

56/150 (37,33%)



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### **Automated Metrics: BLEU Score**

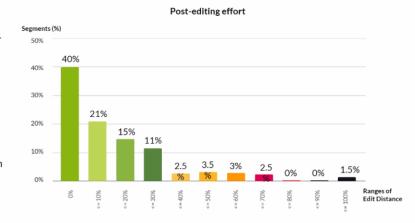
(Bilingual Evaluation Understudy)
Calculates the n-gram
correspondence between the MT
output for a given source
sentence and a human
translations of that sentence.

- · Scores ranges from 0 to 1
- Test bed should be more than 1,000 sentences (and their translations) that were NOT used in the training of the system
- BLEU was designed to speed up the development of SMT.

### **Automated Metrics: Edit Distance**

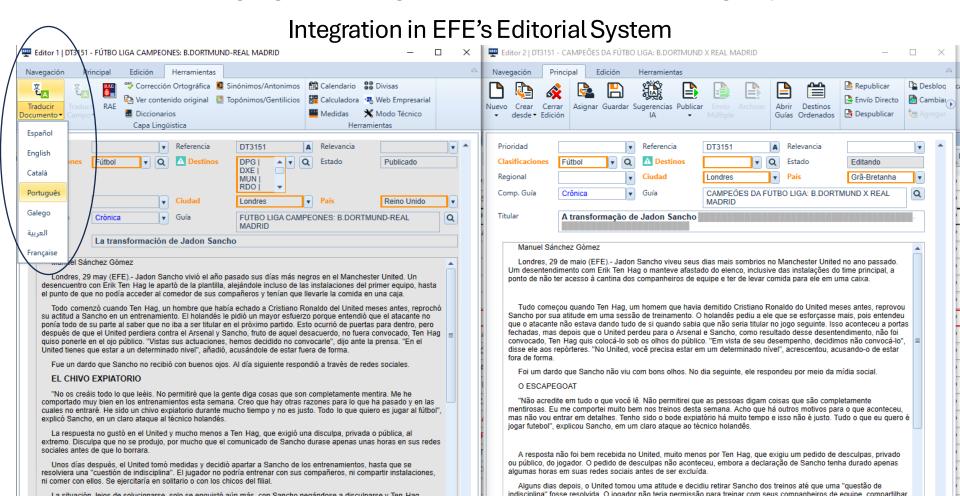
Measuring how many changes were made to MT output to create the final translation.

- The lower a score is, the better.
- Particularly helpful in measuring post-editing efficiency.
- Does not offer information on what kinds of changes were required.





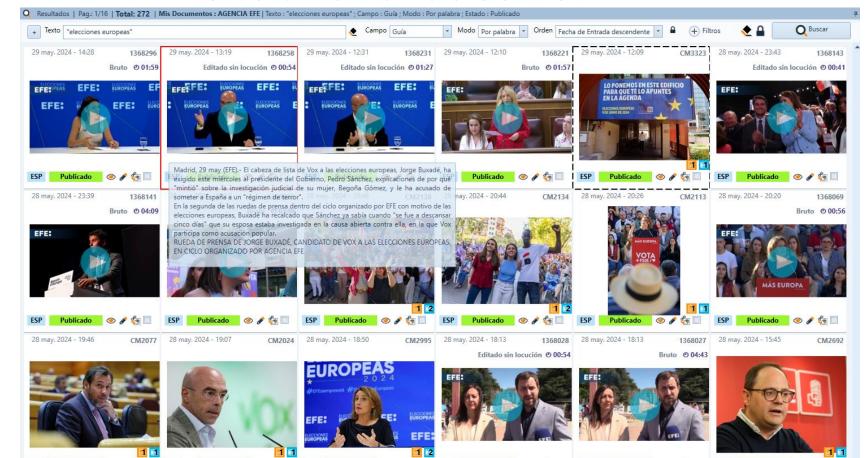




# Multiple Sources, Multiple Languages

Navegación			SPETTACOLO	=== Strega: in cinquina Valerio, Di Pietrantonio, Voltolini(AGI) =
Mis Documentos				Al momento non risultano feriti né persone coinvolte
	_		++ PUTIN, ARMI OCCIDENTALI A KIE	· · · · · · · · · · · · · · · · · · ·
▼ □ @ AGENCIA EFE	B:26 ANSA	A8799	++ PUTIN, ARMI OCCIDENTALI A KIEV	'Ancor peggio se chi le consegna le controlla anche'
► □ ® CENTRAL MADRID	8:26 <b>HSA4</b>	1426	1 POLITICS ELECTION 3RD LEAD	(Adds pars 10, and 24-26)
DELEGACION INTERNACIONAL	8:26 SPF00	00	BRIEF/CYCLISME/	ZLM Tour - Rune Herregodts (Intermarché-Wanty) remporte le contre-la-montre
► □ ® DELEGACION NACIONAL  ▼ Ø ® R AGENCIAS	3:26 ANSA	A8798	F1: VASSEUR, FERRARI CANADÁ	
✓ □ AFP (Agence France-Presse)	B:26 ANSA	A8797	INFLUENCER E CREATOR ADERISCON	Oggi la prima assemblea dei Content Digital Creators
✓ □ AGI (Agenzia Giornalistica Italia)	B:26 ANSA	A8796	PROVENZANO (PD), AGGRESSIONE E	
☑ □ ANSA Árabe (Agenzia Nazionale Stampa Associata)	3:25 ANSA	A8795	ANSA/PAPA: DESEMBARCO EN NORM	Mensaje al obispo de Bayeux por el 80 aniversario del Día D
ANSA Español (Agenzia Nazionale Stampa Associata)	B:25 <b>0807</b> -	-R01	ESTERO	=== Strega: in cinquina Valerio, Di Pietrantonio, Voltolini(AGI) =
🗹 🗀 ANSA Inglés (Agenzia Nazionale Stampa Associata)	3:25 ANSA	A8794	SUPERENALOTTO: 'SIVINCETUTTO', L	I
<ul> <li>✓ □ ANSA Italiano (Agenzia Nazionale Stampa Associata)</li> <li>✓ □ ANSA Portugués (Agenzia Nazionale Stampa Associata)</li> </ul>	3:25 ANSA	A8793	PATUANELLI (M5S), BEPPE C'È SEMPR	3
	B:25 0806-	-R01	ECONOMIA	== FOCUS = Materie prime: tornano a calare prezzi grano e mais =
☑ □ BELGA (Belga News Agency)	8:25 ANSA	A8792	CALCIO: LAMINE YAMAL PRIMO GOLI	La presentazione della classifica parziale a Solomeo in Umbria
➤ ☑ ★ Comunicados Marketwired (GlobeNewswire, Inc.) ☑ □ LUSA ( Agência de Notícias de Portugal, S.A) ☑ □ PA (The Press Association) □ □ PA (The Press Association)	_		SUPERENALOTTO: 'SIVINCETUTTO', L	·
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			MIGRANTI: FOTI (FDI),ITALIA NON SA	
			ESTERO	Bielorussia: Quartapelle (Pd), solidali con Bandarenka =
				Al via il voto in Olanda e la carica dei sovranisti all'Europa
	_			·
05 jun. 2024 -				Se ci fosse un esercito europeo rischieremmo di essere in guerra  ( 'Destra vuole smantellare la Costituzione'

### Translation workflow for audiovisuals





# Custom MT to Custom Post-editing

Original: Los fármacos contra la obesidad han supuesto una auténtica revolución por su eficacia. Y no solo se investiga en ese campo, también en otros como en el de encontrar un arma contra la segunda enfermedad neurodegenerativa más prevalente, el párkinson. Uno de los últimos estudios publicados ha arrojado resultados con un efecto "pequeño" pero con conclusiones "interesantes".

### Translation

medicamentos contra a obesidade representaram uma verdadeira revolução pela sua eficácia. E não é só nesse campo que se investiga, mas também noutros, como encontrar uma arma contra a segunda doença neurodegenerativa mais prevalente, o Parkinson. Um dos últimos estudos publicados apresentou resultados com um efeito "pequeno" mas com conclusões "interessantes".

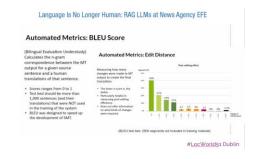


{ "translation": "Os fármacos contra a obesidade representaram uma autêntica revolução pela sua eficácia. E não é só nesse campo que se investiga, mas também noutros, como encontrar uma arma contra a segunda doença neurodegenerativa mais prevalente, o Parkinson. Um dos últimos estudos publicados apresentou resultados com um efeito 'pequeno' mas com conclusões 'interessantes'." }



# challenges

- Over post-editing (MTQE and algorithmic)



- Speed / Cost / Scale
   Prompts may vary from LLM to LLM (like MT: "not one size fits all")
- Choice left to the end-user?





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