

The potential of Language Technology and AI – where we are, where we should be heading

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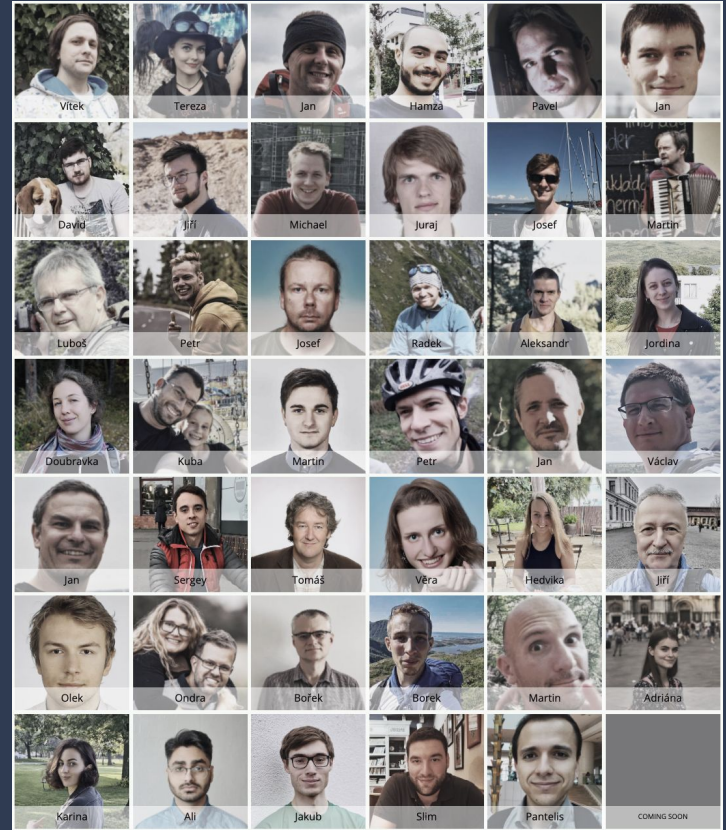




Outline

- MAMA AI Experience
 - Challenges/Trends in building applied AI
 - Conclusion
- 

Meet **Mama AI** team



MAMA AI applies NLP & AI to many segments



mConversational Platform

Conversational AI

Assistants and chatbots, design for voice and text, deflection of common tasks, customer sentiment



mSpeech Platform

Speech

Call center transcriptions, call logs analytics, speaker id and verification, mood detection, agent guidance



Edge/IoT/Hybrid

NLP and Voice on embedded platforms (gaming, automotive, note/offline use)

mVoice Platform

mCloudNative



TELMA.AI

Omni-Channel Interaction

Interactive customer notifications, upsell/cross-sell, user profiles



mNLP Platform

Natural Language Processing

Natural Language Understanding, written or spoken reports from structured data



mAI Platform

mBioInformatics

Applied AI

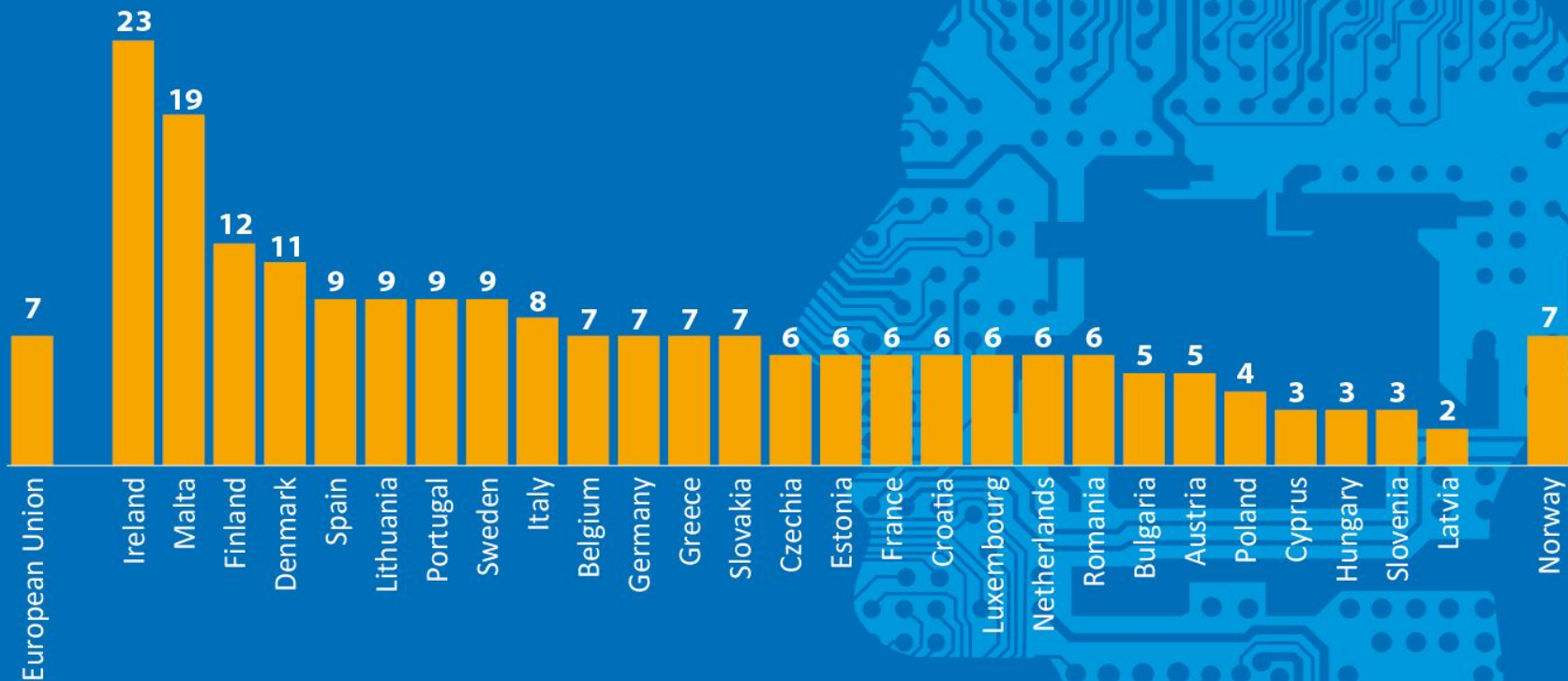
Acoustic monitoring and prediction, predictive maintenance, AIOps

mSearch Platform

mAIOps

Enterprises using artificial intelligence*

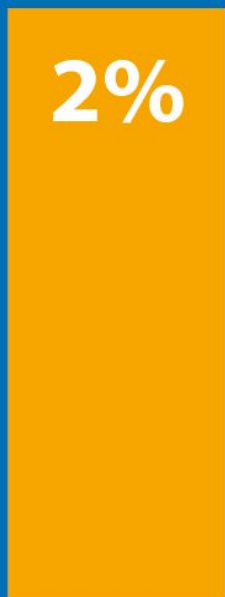
(% of enterprises with at least 10 people employed, excl. financial sector, 2020 data)



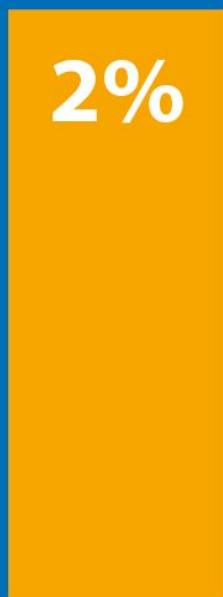
* For more information on the measurement of the use of AI applications by enterprises, see the notes

Enterprises using artificial intelligence in the EU

(% of enterprises with at least 10 people employed, excl. financial sector, 2020 data)



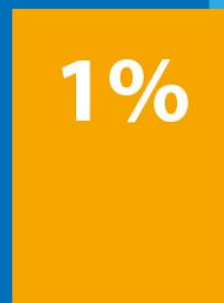
Analyse big data internally using machine learning



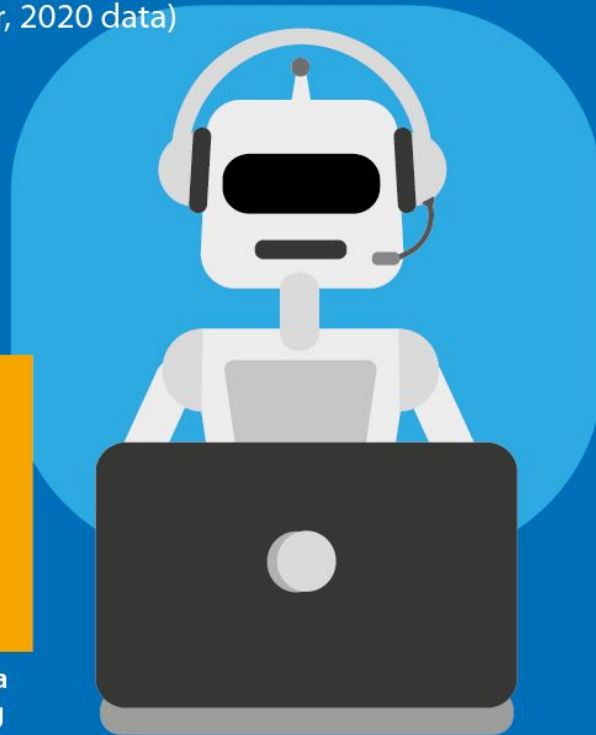
Use of a chat service where a chatbot or virtual agent replies to customers



Use service robots



Analyse big data internally using natural language processing, generation or speech recognition



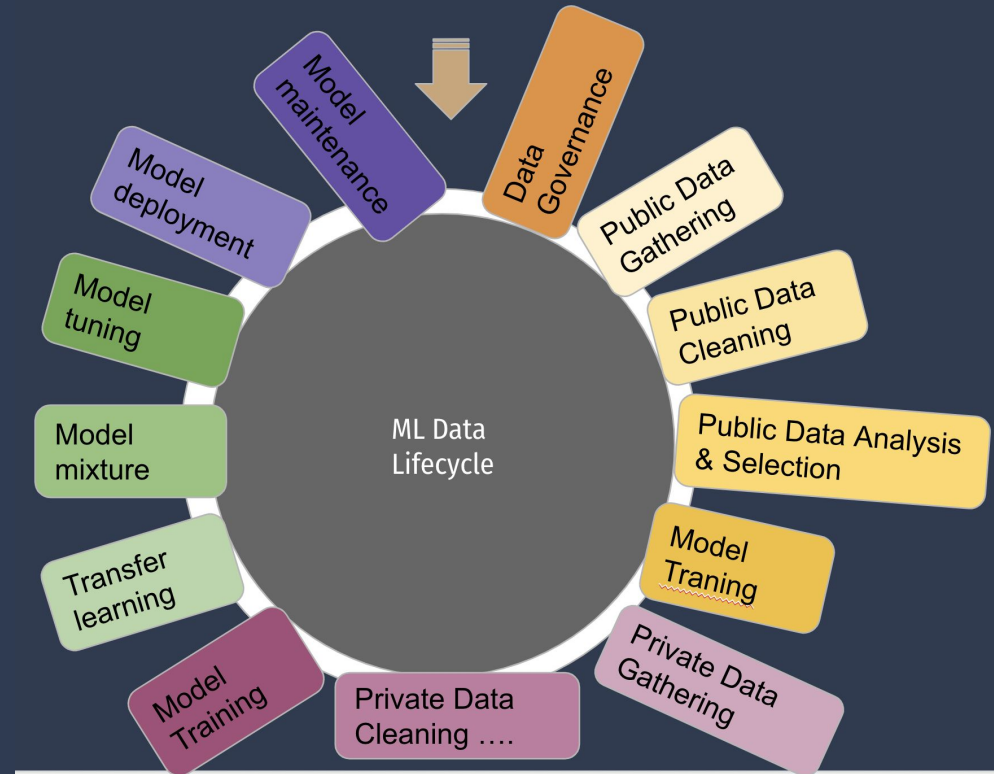


Challenges/Trends in applied NLP & AI



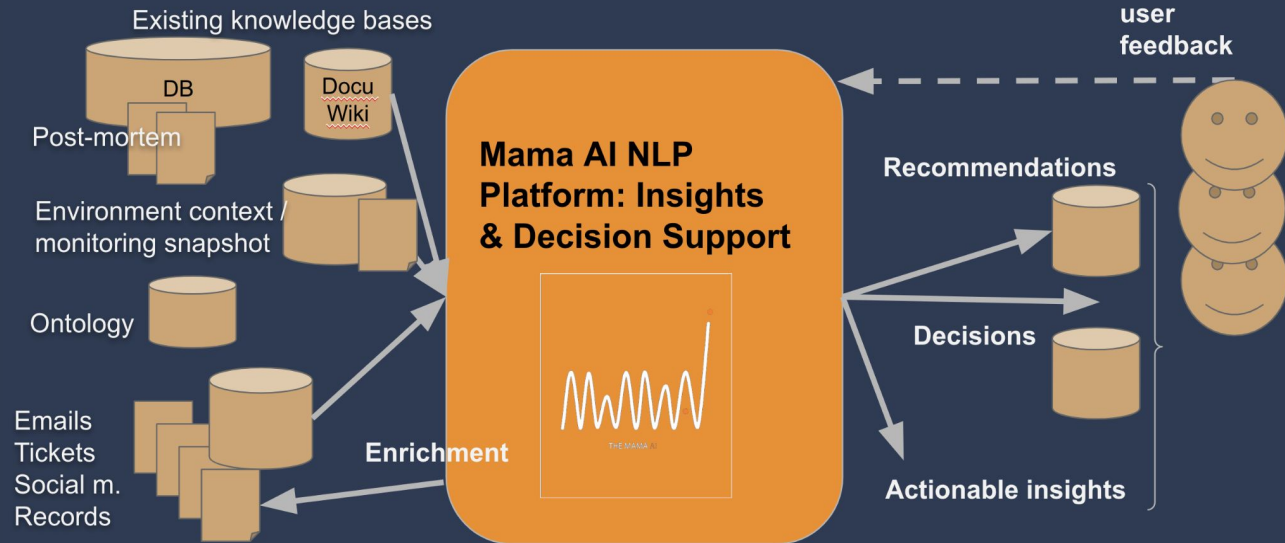
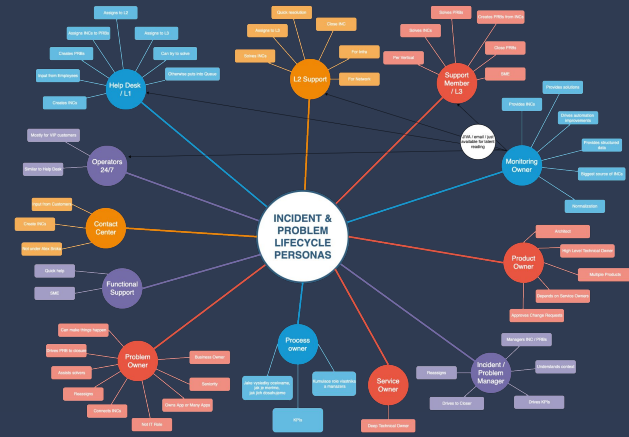
Wider automation

- Key parameters of success:
 - Time to market
 - Cost of deployment
 - Cost of maintenance
- Human labor vs Automation
- Automated collection of data
- Automated model building
- Automated testing
- Automated deployment
- Example - fully automated FAQ voicebots



Better Integration

- Integration to existing customer's infrastructure
- Explainability
- Continuous Learning
- Prepared business solutions
- Prepared SW integrations



Zero/Low-code Tooling

- Tooling is key for the consumability of technology
- Adapt the complexity to skills of the users
- Need to understand the personas
- Distinguish "Regular" vs "Power users" vs "Admins"
- Example - [Telma.ai](#) Outbound calls

The screenshot displays the TelmaPortal interface for configuring a workflow. On the left, the 'TelmaPortal' logo and navigation menu (Campaigns, My voicebots) are visible. The main workspace shows a workflow titled 'Invoice due date reminder' with the following steps:

- Name:** Invoice due date reminder
- Language:** English
- Initial user response timeout (ms):** 1500
- Voice:** Jenny - US
- Description:** Invoice due date reminder

The workflow consists of three prompts:

- Prompt 1:** Hello, !(\$salutation_vocative). I'm calling as a company representative of !(\$company_name).
- Prompt 2:** I'd like to remind you of an overdue invoice for !(\$service). The invoice was sent to your email a few days ago.
- YES/NO question:** Do you plan to pay in the next three days?

For the YES/NO question, the interface shows response options and example responses:

- Response to YES:** Thank you, I'm glad to hear that. Have a nice day.
- Response to NO:** I'm taking a note, my colleague will contact you. Looking forward to hearing from you.
- Responses taken as YES:** I am planning, I'm planning, We are planning, I want to pay, I will send, I will pay, I do
- Responses taken as NO:** I don't plan, I am not planning, I'm not planning, I will not pay, I will not send, I won't pay, I don't

On the right side, a 'Variables table' is shown:

Variable	Value
<u>salutation_vocative</u>	Mr. Smith
<u>company_name</u>	Telma
<u>service</u>	made telephone calls

Below the table, a 'Test call' section shows a phone number input field with '+420' and a 'Phone number' label.

Efficient Testing, Monitoring, Alerting

- Regression
- A/B testing
- AI tests AI - Voicebots test voicebots
- Smart Adaptive Monitoring and Alerting
- Self-diagnostics
- Self-repair

The screenshot shows the TelmaPortal interface for configuring a campaign. The left sidebar has a purple header with the TelmaPortal logo and navigation options for 'Campaigns' and 'My voicebots'. The main content area is titled 'Invoice payment reminder' and includes tabs for 'Overview' and 'Outgoing calls'. The 'Overview' tab is active, showing a description, language (English), voice (Jenny - US), and voicebot (Invoice due date reminder). It also features a progress bar with stages 'Created', 'Launched', and 'Completed', a 'Suspend' button, and a 'Download summary after all calls are finished' button. A donut chart shows the campaign status: 6/6 (100%) completed, with a legend for pending, initiating, initiated, declined, unconnected, and finished.

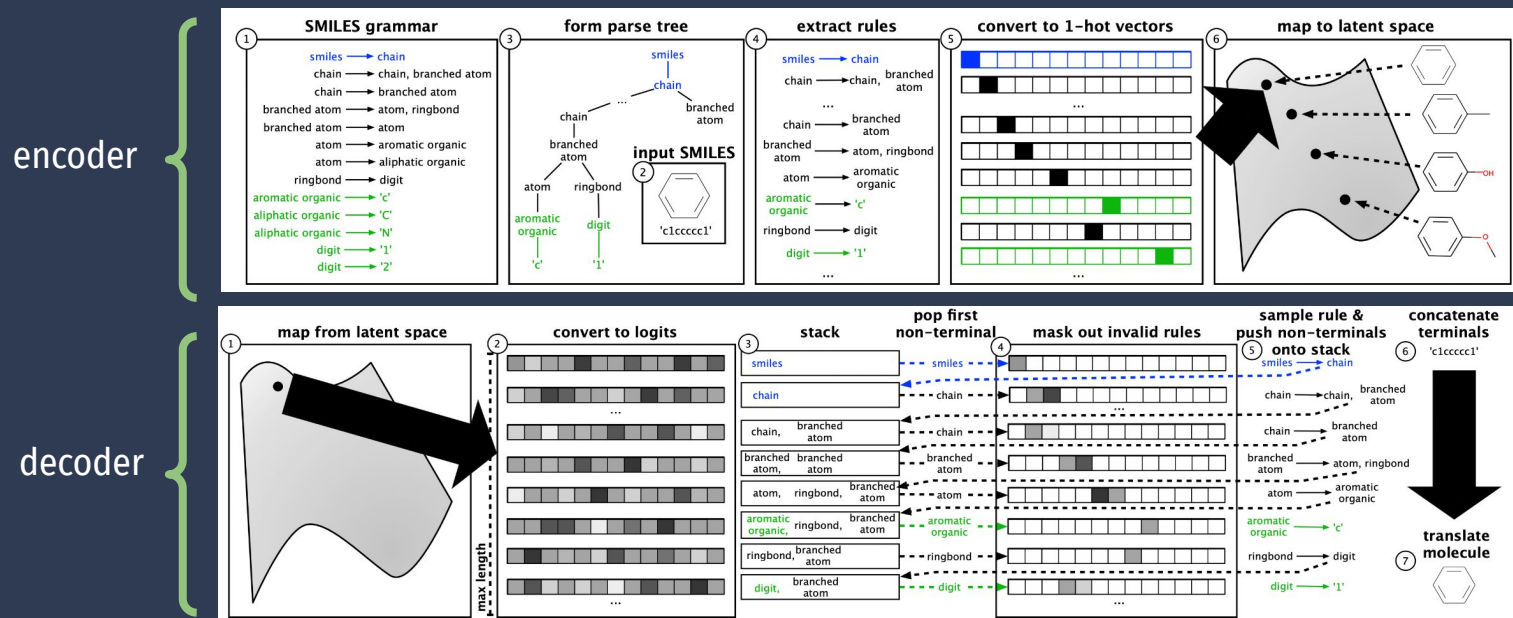
The screenshot shows an Excel spreadsheet titled 'summary_Invoice payment reminder.xlsx'. The spreadsheet has a green header row with columns: phone, bot_name, language, run_attempt, result, call_duration, ringing_duration, and Do you plan to pay in the next three days?. The data rows show the following information:

phone	bot_name	language	run_attempt	result	call_duration	ringing_duration	Do you plan to pay in the next three days?
420737264	Invoice due date reminder	en	1	finished	0	11	
420608731	Invoice due date reminder	en	1	finished	28	4	TRUE
420604740	Invoice due date reminder	en	2	finished	29	6	FALSE
420604384	Invoice due date reminder	en	1	finished	0	1	
420777651	Invoice due date reminder	en	2	finished	33	14	TRUE
420777299	Invoice due date reminder	en	1	finished	28	12	FALSE



Cross-domain transfer learning

- ML/DL Techniques and approaches from one-domain applied to another domain
 - NLP inspires bioinformatics and vice versa
 - Cross-learning in Vision, NLP, LT, Speech, VR, Bio, Crypto, Quantum

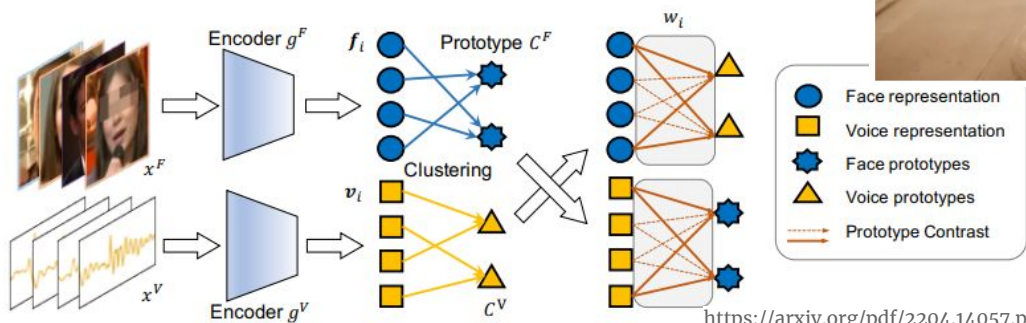


Cross-modal learning

- Learn from several modalities at the same time (text, video, audio)
 - object detection
 - scene understanding
 - activity recognition
- One modality influences the other
- Need more such data sources



PeopleImages / Getty Images



<https://arxiv.org/pdf/2204.14057.pdf>

Applied Ethics

Privacy - Explainability - Accessibility - Debiasing

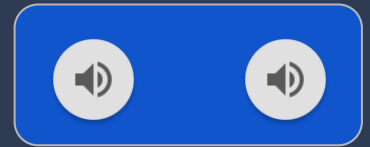
Example in Speech synthesis

- Human level generated TTS starts to be indistinguishable from humans

mVoice
examples

Data collection methodology

- Human vs AI-generate artefacts
- Data samples unrecognizable from the "real ones"



Antrophomorphisation of Voice Agents

- AI users often tend to share excessive amounts of sensitive information

Circular AI. Sustainable AI.

Ever increasing size of NLP models

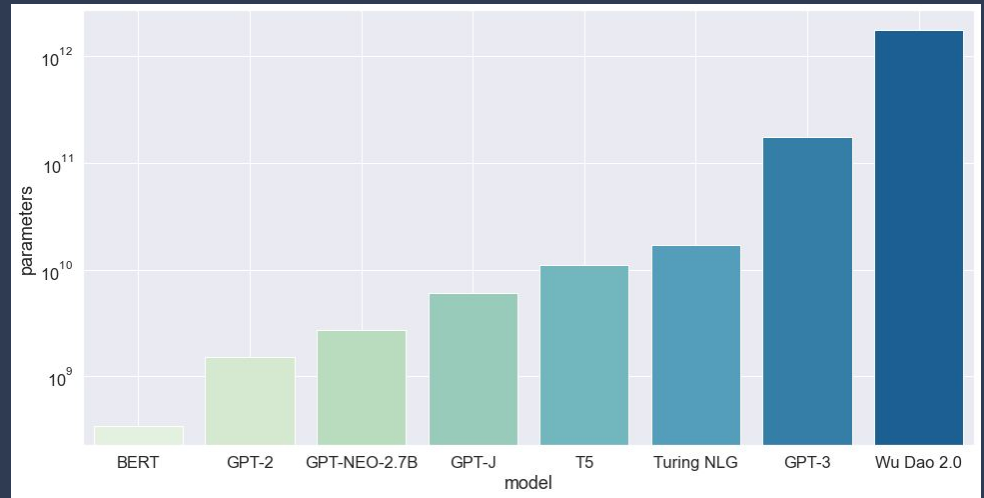
- Enormous energy consumptions to train and run models

Centralization of large NLP models

- Data, equipment, and energy requirements limit the accessibility

Circular AI Economy

- sharing, leasing, reusing, refurbishing, recycling AI



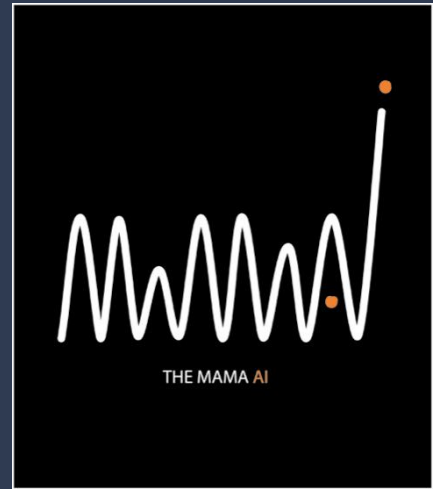
Conclusion

NLP & AI for business need to deal with the following needs/trends:

- Automation
- Integration
- Ergonomic Tooling
- Quality Assurance
- Continuous learning
- Cross-modal learning
- Cross-domain learning
- Circular, sustainable, and ethical approaches

What are the implications for **Data** and **Data Collection** processes?

Thank you!



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