## AI (Artificial Intelligence) for CMS and roadmap in Drupal





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Working for past 21 years and working in Drupal for more than 14 years.







Understanding AI and it related terminologies



AI technologies



Al in Content Management System (CMS)



The State of AI in Drupal



Probable Roadmap of AI in Drupal

Why AI?

Artificial Intelligence (AI) value evaluated by 2030

\$13 trillion

	Travel	128
	Transport and logistics	89
	Retail	87
	Automotive and assembly	85
2	High tech	85
	Oil and gas	79
	Chemicals	67
X	Media and entertainment	57
	Basic materials	56
	Agriculture	55
$\mathbf{O}$	Consumer packaged goods	55
Î	Banking	50
	Healthcare systems and services	44
	Public and social sectors	44
	Telecommunications	44
Po	Pharmaceuticals and medical products	39
	Insurance	38
	Advanced electronics/semiconductors	36
	Aerospace and defense	30

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Source: McKinsey Global Institute analysis



## Artificial Intelligence (AI) is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by humans or animals.







#### **Artificial Narrow Intelligence (ANI)**

Self Driving Cars

Smart Speakers

Intelligent Web Search

Automatic content classification







#### Artificial General Intelligence (AGI)

Warming up ...



Many more...

## Al Terminologies





MACHINE LEARNING







NEURAL DEEP LEARNING NETWORKS





## Types of Machine Learning



### Example Use Case: Image Sentiment Engine





### Example Use Case: Image Sentiment Engine



Unsupervised Learning

### Example Use Case: Image Sentiment Engine





**Reinforcement Learning** 

# ✓ Types of Machine Learning



#### **Supervised Learning**

Approach: Training

Applications: Risk Evaluation, Forecast Sales, Spam Filtering



Semi-supervised



**Unsupervised Learning** 

Approach: Explore patterns and

**Applications: Recommendation** 

Systems, Anomaly Detection

trends



#### **Reinforcement Learning**

Approach: Trail and Error Applications: Self Driving Cars, Gaming





# O Deep Learning implementation challenges



LOTS OF DATA TIME-CONSUMING COMPUTING TIME COST



## Al Technologies



# Machine Learning Frameworks/Libraries Most Popular :

Parameters	TensorFlow	PyTorch	Keras
Ease of Use	Easy in JavaScript, not easy otherwise	Easy Python APIs	Very Easy Python APIs
Speed	High	High	Slow
Architecture	Complex	Very Complex	Simple
Debugging	Difficult	Easy	Easy
Level of API	Both High and Low	Low	High

All are open source.

Lots of example code is available on GitHub.



Machine Learning Cloud APIs- Most Popular

- Google Cloud Machine Learning API https://cloud.google.com/products/ai/
- Amazon ML API

https://aws.amazon.com/machinelearning/

• Azure Machine Learning API

https://docs.microsoft.com/enus/rest/api/azureml/







## The State of Al in Drupal

No need to re-invent the wheel

We already have some help 😳



### **Google Cloud** Google Vision API Module





#### **Google Cloud** Google Natural Language API Module







Watson Natural Language Understanding



#### **Google** Cloud **Google Translator Module**

#### **Google Cloud** TMGMT Translator Google Module

#### **Google** Cloud Translate Drupal with GTranslate Module





## Acould Acquia Lift Connector Module





## Scoogle Cloud Google Text to Speech Module







### Coogle Cloud Dialogflow (Api.AI) Webhook Module



## Probable Roadmap of Al in Drupal

**ADVANCED ANALYTICS** 



**MIGRATION** 









**INTERACTION WITH OTHER AI SYSTEMS** 

**REAL-TIME SEO** RECOMMENDATIONS

INTELLIGENT DIGITAL ASSET MANAGEMENT (DAM)



Stabilize/Extend Existing Modules

There are lots of AI integration modules in Drupal which are in alpha/previous / outdated version. Few of them are:

- <u>Azure Cognitive Services API Module –</u> package for 4 different AI modules (Face , Emotion Recognition, Computer Vision API , Azure Text Analytics) - latest version- <u>8.x-1.2</u> (2017)
- <u>Google Natural Language Autotag Module</u> This module provides functionality to autotag content using Google's Natural Language API – latest version - <u>8.x-1.0</u> (2018)
- <u>Google Speech to Text Module</u> uses Google Speech to Text Service latest version- <u>8x.-1.4</u> (2019)
- <u>IBM Watson Module</u> uses IBM Speech to Text service provides REST API -latest version- <u>8.x-1.0-alpha2</u> (2019)
- Intelligent Content Tools Module This module provides functionalities like: Auto Tagging, Text Summarization, Duplicate Content Identification - latest version- <u>8.x-1.0</u> (2019, dev-2020)
- <u>TensorFlow Module</u> using <u>TensorFlow.js</u>, which is a JavaScript implementation of <u>TensorFlow</u>, using the <u>Component</u> module - latest version- <u>1.0.x-dev</u> (2021)



### AI drawbacks

- Accuracy Not 100%
- Bias
- Privacy
- Data Acquisition
- Error Prone



## Questions?





https://en.wikipedia.org/wiki/Artificial intelligence

https://towardsdatascience.com/top-8-ai-and-machine-learning-frameworks-for-beginners-4e3996fc27f

https://neptune.ai/blog/best-mlops-tools

https://www.ibm.com/demos/live/natural-language-understanding/self-service/home

https://hackernoon.com/the-missing-pieces-6-limitations-of-ai-s85r3upr

https://www.analyticsvidhya.com/blog/2020/04/supervised-learning-unsupervised-learning/

https://en.wikipedia.org/wiki/Supervised learning

https://en.wikipedia.org/wiki/Unsupervised learning

https://en.wikipedia.org/wiki/Reinforcement learning

https://readwrite.com/2019/11/02/machine-learning-for-translation-whats-the-state-of-the-language-art/? cf chl jschl tk =pmd f.dxjd7YygxBpLqZCfUDn1YVnISPM3nPJOO.yD9THHc-1631023052-0-gqNtZGzNAnujcnBszQmL

https://medium.com/analytics-vidhya/ml03-9de2f0dbd62d

https://www.forbes.com/sites/forbestechcouncil/2019/08/02/the-role-of-ai-in-the-future-of-content-managementsystems/?sh=586db6ae526b

https://www.itexchangeweb.com/blog/shaping-the-future-of-enterprise-content-management-with-artificial-intelligence/ https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-applications-and-value-of-deeplearning

https://intellipaat.com/blog/supervised-learning-vs-unsupervised-learning-vs-reinforcement-learning/

https://www.youtube.com/watch?v=6pkD-tmxT5U

https://www.youtube.com/watch?v=kHrniHfdakU

